ANNUAL REPORT

OF THE

SURGEON-GENERAL OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE OF THE UNITED STATES

FOR THE

FISCAL YEAR 1906

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1907.

TREASURY DEPARTMENT.

Document No. 2456.

Public Health and Marine-Hospital Service.

2

OPERATIONS

OF THE

UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

1906.

TREASURY DEPARTMENT.

Document No. 2456.

Public Health and Marine-Hospital Service.

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LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
Washington, December 7, 1906.

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, entitled "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the annual report of the Surgeon-General of the Public Health and Marine-Hospital Service for the fiscal year 1906.

Respectfully,

L. M. SHAW,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

ANNUAL REPORT

OF THE

SURGEON-GENERAL PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND
MARINE-HOSPITAL SERVICE,
Washington, D. C., November 27, 1906.

SIR: I have the honor to submit, for transmission to Congress, in accordance with the act of July 1, 1902, the following report of transactions of the Public Health and Marine-Hospital Service of the United States for the fiscal year ended June 30, 1906, this being the thirty-fifth annual report of the Service in the one hundred and eighth year of its existence, and the fifth annual report under its new name.

The operations of the Bureau are conducted through seven divisions. The officers in charge of these divisions at the close of the fiscal year 1906 were the following assistant surgeons-general, viz: A. H. Glennan, personnel and accounts; W. J. Pettus, marine hospitals and relief; H. D. Geddings, quarantine and medical inspection of immigrants (two divisions); J. M. Eager, sanitary reports and statistics; J. W. Kerr, scientific research and sanitation; and Asst. Surg. J. W. Trask, miscellaneous.

In the following report the transactions of the Service are recorded as conducted in each division.

It will be observed that some features of previous annual reports are omitted, they being included in Public Health Reports, the bulletins of the hygienic laboratory and of the Yellow Fever Institute, or other publications of the Service. Reports of necropsies, which have appeared in all the annual reports since 1881, are now omitted and will either be published elsewhere or kept on file for future use if desired in the compilation of statistics.

PERSONNEL.

COMMISSIONED OFFICERS.

The commissioned medical officers at the beginning of the fiscal year July 1, 1905, numbered 120, as follows: The Surgeon-General, 5 assistant surgeons-general, 27 surgeons, 51 passed assistant surgeons, and 36 assistant surgeons.

Two surgeons and 1 passed assistant surgeon continued on detailed duty to the Isthmian Canal Commission, Canal Zone.

Two surgeons, 7 passed assistant surgeons, and 5 assistant surgeons are assigned to immigration duty for the examination of aliens.

Four passed assistant surgeons and 3 assistant surgeons are detailed to the quarantine service of the Philippine Islands.

Three passed assistant surgeons and 4 assistant surgeons are detailed for service upon vessels of the Revenue-Cutter Service.

Five passed assistant surgeons and 3 assistant surgeons are assigned to duty in foreign countries to prevent the introduction into the United States of contagious or epidemic diseases.

Two passed assistant surgeons were promoted to the grade of surgeon, 10 assistant surgeons to the grade of passed assistant surgeon, and 2 candidates were commissioned assistant surgeons.

One assistant surgeon-general resigned, 1 surgeon died, 1 passed assistant surgeon died, and 1 passed assistant surgeon resigned. The number remaining in the Service June 30, 1906, were the Surgeon-General, 5 assistant surgeons-general, 28 surgeons, 56 passed assistant surgeons, and 28 assistant surgeons; total, 118.

No board was convened during the year for the examination of candidates for admission to the Service.

NONCOMMISSIONED OFFICERS.

Sanitary inspectors.—Three sanitary inspectors served during the entire year.

Acting assistant surgeons.—At the beginning of the fiscal year there were 190 acting assistant surgeons on duty; 247 were appointed, 2 died, and 230 were separated from the Service by limitation of appointments, resignations, and removals, leaving on duty at the close of the fiscal year 205 such officers.

Medical inspectors.—Two female medical inspectors served during the entire year for the inspection of women passengers, 1 at Honolulu, Hawaii, and 1 at San Francisco quarantine station.

Internes.—At the beginning of the fiscal year there were 13 internes on duty at the various marine-hospital stations; 19 were appointed, and 22 were separated from the Service by reason of resignation, leaving 10 on duty at the close of the fiscal year.

Pharmacists.—At the beginning of the fiscal year there were on duty 48 pharmacists, divided as follows: Pharmacists of the first class, 16; second class, 23; third class, 9. One pharmacist of the first class died; 1 pharmacist, second class, was removed; 2 pharmacists, second class, and 1 of the third class resigned. One appointment was made to the position of pharmacist third class, and 1 was reinstated, which, together with promotions to fill vacancies caused by death, resignations, and removals, as above, leaves 45 pharmacists on duty at the close of the fiscal year, as follows: Pharmacists of the first class, 15; second class, 21; third class, 9.

Pilots and marine engineers.—At the beginning of the fiscal year there were on duty 12 pilots and 21 marine engineers. Three pilots resigned, 1 was removed, and 2 were appointed. Eight marine engineers were separated from the Service and 5 were appointed. The number on duty at the close of the fiscal year is as follows: Pilots, 10; marine engineers, 18.

HOSPITAL AND QUARANTINE ATTENDANTS.

At the beginning of the fiscal year 670 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, not including 67 such employees on duty in the Philippine Islands, and at the close of the fiscal year there were 659 so employed, as follows:

Branch of service in which employed.	In Service July 1, 1905.	Appointed during year.	Separated from Service.	In Service June 30, 1906.
Marine-Hospital Service	406	1,010	995	421
Quarantine (including Porto Rico and Hawaii)	220	186	190	216
Epidemic	44	35	57	22
Total	670	1,231	1,242	659
Philippine Islands	67	30	21	76

RECAPITULATION.

Commissioned medical officers	118
Chiefs of divisions, hygienic laboratory	3
Sanitary inspectors	3
Acting assistant surgeons	205
Medical inspectors	2
Internes	10
Pharmacists	45
Pilots	10
Marine engineers	18
Attendants	735
Total	1,149

BOARDS CONVENED.

Thirty-one boards were convened at different times and at various stations throughout the United States for the physical examination of officers of the Revenue-Cutter Service and applicants for entrance therein.

One board was convened for the examination of passed assistant surgeons to determine their fitness for promotion to the grade of surgeon.

Two were convened for the examination of assistant surgeons to determine their fitness for promotion to the grade of passed assistant surgeon.

One to examine an officer of the Service to determine whether his physical condition was such as to entitle him to be placed on "waiting orders."

One to make physical examination of an employee of the Immigration Service.

Eight officers were assigned to duty on Revenue-Cutter Service retiring boards.

One board was convened for the investigation as to the origin and prevalence of typhoid fever in the District of Columbia.

OFFICERS DETAILED TO REPRESENT THE SERVICE AT MEETINGS OF MEDICAL AND PUBLIC HEALTH ASSOCIATIONS.

Asst. Surg. Gen. George T. Vaughan: Meeting of Association of Military Surgeons, at Detroit, Mich., September 26–29, 1905.

Asst. Surg. Gen. J. W. Kerr: National Association for the Study and Prevention of Tuberculosis, at Washington, D. C., May 10–18, 1906.

Surg. P. H. Bailhache: American Medical Association, at Boston, Mass., June 5–8, 1906.

Surg. H. W. Austin: Association of Military Surgeons, at Detroit, Mich., September 26–29, 1905; Fifteenth International Congress of Medicine, at Lisbon, Portugal, April 19–25, 1906.

Surg. R. M. Woodward: American Public Health Association, at Boston, Mass., September 25–29, 1905.

Passed Asst. Surg. G. B. Young: Meeting of Council on Medical Education of American Medical Association, at Chicago, Ill., May 12, 1906.

Passed Asst. Surg. M. J. Rosenau: American Medical Association, Boston, Mass., June 5–8, 1906.

ACCOUNTS.

Attention is invited to the diminished amount of total expenditures payable from the Public Health and Marine-Hospital Service fund as compared with the fiscal year 1905, and also to the fact that at the close of the fiscal year 1906 the balance of this fund, including estimated outstanding liabilities of $82,000, amounts to $380,313.47. This amount is transferable into the Treasury, being available but not expended during the fiscal year 1906. For the fiscal year 1907 Congress has made specific appropriations, and the fund derived from tonnage taxes is no longer used for the support of the Service, as provided in the act approved March 3, 1905, as follows:

> That so much of section fifteen of an act entitled "An act to remove certain burdens on the American merchant marine and encourage the American foreign carrying trade, and for other purposes," approved June twenty-sixth, eighteen hundred and eighty-four, as makes a permanent appropriation of the receipts for duties on tonnage provided for by said act for the expenses of maintaining the Marine-Hospital Service is hereby repealed, to take effect from and after June thirtieth, nineteen hundred and six. And the Secretary of the Treasury shall, for the fiscal year nineteen hundred and seven, and annually thereafter, submit to Congress, in the regular Book of Estimates, detailed estimates of the expenses of maintaining the Public Health and Marine-Hospital Service.

VOUCHERS PASSED FOR PAYMENT AND SETTLEMENT.

The records of the Bureau show that 17,484 vouchers were passed during the year. Of this number 15,757 were sent to the special disbursing agent for payment, 551 were transmitted to the Auditor for the Treasury Department for examination and settlement, and 1,176 were examined and referred to the Auditor, they having previously been paid by special disbursing agents of the Service.

FINANCIAL STATEMENT—RECEIPTS AND EXPENDITURES, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, FOR THE FISCAL YEAR ENDED JUNE 30, 1906.

Public Health and Marine-Hospital Service.

Balance July 1, 1905		$230,124.98
Amount appropriated by Congress		200,000.00
Tonnage tax		966,421.22
Other receipts, immigration, care of foreign seamen, etc		114,039.78
Total		1,510,585.98
Expenditures:		
Maintenance of stations	$854,690.76	
Repairs of buildings	62,190.22	
Fuel, light, and water	73,681.34	
Furniture and repairs	3,668.81	
Heating apparatus	4,754.39	
Purveying depot	50,124.49	
Salaries, Surgeon-General's office	41,162.50	
		1,090,272.51
Balance June 30, 1906		420,313.47

Outstanding liabilities, estimated, $82,000.

Quarantine service, 1906.

Amount of appropriation	$340,000.00
Repayments, subsistence furnished, etc	1,702.19
Total	341,702.19
Expenditures	308,330.04
Balance, June 30, 1906	33,372.15

Outstanding liabilities, $17,074.33 (estimated).

Expenditures by stations.

Name of station.	Maintenance of stations, salaries, supplies, subsistence, and miscellaneous.	Medical and hospital supplies.	Total.
Biscayne Bay	$3,778.79	.....	$3,778.79
Boca Grande	3,034.64	$19.63	3,054.27
Brunswick	5,488.61	152.73	5,641.34
Cape Charles	13,748.47	294.46	14,042.93
Cape Fear	7,952.07	356.18	8,308.25
Cedar Keys	730.00	.....	730.00
Columbia River	15,318.62	21.28	15,339.90
Cumberland Sound	4,217.93	.....	4,217.93
Delaware Breakwater	7,516.68	127.65	7,644.33
Gulf	19,611.32	612.64	20,223.96
Hawaii	36,171.16	207.97	36,379.13
Key West	4,457.44	4.95	4,462.39
Miscellaneous	1,033.60	.....	1,033.60
Perth Amboy	3,571.89	12.72	3,584.61
Portland	7,218.28	30.84	7,249.12
Porto Rico	30,002.79	1,164.32	31,167.11
Port Townsend	15,223.78	146.20	15,369.98
Reedy Island	23,062.07	352.08	23,414.15
St. Georges Sound	3,231.00	.....	3,231.00
St. Johns River	2,223.25	.....	2,223.25
San Diego	7,466.49	36.09	7,502.58
San Francisco	42,195.62	276.87	42,472.49
Santa Rosa	10,105.44	480.41	10,585.85
Savannah	17,398.23	153.09	17,551.32
South Atlantic	10,222.86	225.49	10,448.35
Tampa Bay	8,318.34	355.07	8,673.41
Total	303,299.37	5,030.67	308,330.04

Preventing the spread of epidemic diseases.

Balance July 1, 1905		$331,476.(
Amount appropriated by Congress		200,000.(
Total		531,476.(
Expenditures:		
Foreign medical service, salaries and miscellaneous—		
China, Japan, Italy, etc., Central and South America	$65,777.25	
Havana, Cuba (including outlying district), salaries, subsistence supplies, and miscellaneous	16,162.61	
Mexico, salaries, supplies, etc	5,247.47	
Sanitary inspection in United States, salaries, traveling expenses, and miscellaneous	29,149.06	
Yellow fever, maintenance of detention camps, precaution against outbreak, salaries, medical and hospital supplies, disinfectants, etc	110,767.56	
Texas border inspection, salaries, and miscellaneous	6,919.70	
		234,023.(
Balance June 30, 1906		297,453.(

Outstanding liabilities estimated, $4,000.

Leprosy hospital, Hawaii, buildings and equipment.

Amount appropriated		$100,000.(
Amount transferred to Supervising Architect	$75,000.00	
Expended, July 1, 1905, to June 30, 1906	124.10	
		75,124.1
Balance June 30, 1906		24,875.9

Leprosy hospital, Hawaii, maintenance, 1906.

Amount appropriated		$50,000.(
Expended, July 1, 1905, to June 30, 1906		2,607.7
Balance June 30 1906		47,392.2

Appropriations, marine hospitals.

Chicago, Ill, act March 3, 1905:	
Amount appropriated	$2,500.(
Expended, July 1, 1905, to June 30, 1906	1,367.(
Balance June 30, 1906	1,132.9
Louisville, Ky., act March 3, 1905:	
Amount appropriated	6,000.(
Amount transferred to Supervising Architect	6,000.(
San Francisco, Cal., act March 3, 1905:	
Amount appropriated	6,000.(
Amount transferred to Supervising Architect	6,000.(
San Francisco, Cal., act April 28, 1904:	
Balance July 1, 1905	8,000.(
Amount transferred to Supervising architect	8,000.(
Cairo, Ill., act April 28, 1904:	
Balance July 1, 1905	5,000.(
Amount transferred to Supervising Architect	5,000.(

Appropriations, quarantine stations.

Reedy Island, act March 3, 1905:		
Amount appropriated		$11,600.(
Amount transferred to Supervising Architect	$10,500.00	
Expended, July 1, 1905, to June 30, 1906	414.03	
		10,914.(
Balance June 30, 1906		685.9

Reedy Island, act March 3, 1901:		
Balance July 1, 1905		$667.95
Balance June 30, 1906		667.95
Reedy Island, act April 28, 1904:		
Balance July 1, 1905		2,227.41
Expended, July 1, 1905, to June 30, 1906		2.40
Balance June 30, 1906		2,225.01
Gulf, act March 3, 1905:		
Amount appropriated		10,600.00
Amount transferred to Supervising Architect	$10,000.00	
Expended, July 1, 1905, to June 30, 1906	33.20	
		10,033.20
Balance June 30, 1906		566.80
Gulf, act March 3, 1899:		
Balance July 1, 1905		824.56
Balance June 30, 1906		824.56
San Francisco, act March 3, 1905:		
Amount appropriated		10,500.00
Expended, July 1, 1905, to June 30, 1906		7,985.95
Balance June 30, 1906		2,514.05
San Francisco, act June 6, 1900:		
Balance July 1, 1905		9,808.67
Expended, July 1, 1905, to June 30, 1906	$3,226.63	
Outstanding liabilities	1,799.50	
		5,026.13
Balance June 30, 1906		4,782.54
Columbia River, act March 3, 1905:		
Amount appropriated		7,500.00
Amount transferred to Supervising Architect		7,500.00
Port Townsend, act March 3, 1905:		
Amount appropriated		9,500.00
Expended, July 1, 1905, to June 30, 1906		560.00
Balance June 30, 1906		8,940.00
Port Townsend, act March 3, 1901:		
Balance July 1, 1905		39,976.30
Outstanding liabilities		10.19
Balance June 30, 1906		39,966.11
Savannah, act June 6, 1900:		
Balance July 1, 1905		112.20
Balance June 30, 1906		112.20
Savannah, act April 28, 1904:		
Balance July 1, 1905		12,500.00
Amount transferred to Supervising Architect		12,000.00
Balance June 30, 1906		500.00

Key West, Mullet Key, act June 6, 1900:		
Balance July 1, 1905		$38,300.0
Amount transferred to Supervising Architect	$16,000.00	
Expended July 1, 1905, to June 30, 1906	482.52	
		16,482.5
Balance June 30, 1906		21,817.5
South Atlantic, act June 28, 1902:		
Balance July 1, 1905		3,329.6
Balance June 30, 1906		3,329.6
South Atlantic, act June 4, 1897:		
Balance July 1, 1905		453.0
Balance June 30, 1906		453.0
Mayport, Fla., act June 28, 1902:		
Balance July 1, 1905		1,500.0
Balance June 30, 1906		1,500.0
Miami, Fla., act June 28, 1902:		
Balance July 1, 1905		228.5
Balance June 30, 1906		228.5
Boca Grande, act June 28, 1902:		
Balance July 1, 1905		500.0
Balance June 30, 1906		500.0
Pensacola, act June 28, 1902:		
Balance July 1, 1905		2,640.4
Amount transferred to Supervising Architect		2,500.0
Balance June 30, 1906		140.4
Pensacola, act March 3, 1903:		
Balance July 1, 1905		12,415.2
Amount transferred to Supervising Architect		12,000.0
Balance June 30, 1906		415.2
San Diego, act March 3, 1903:		
Balance July 1, 1905		6,000.0
Balance June 30, 1906		6,000.0
San Diego, act June 28, 1902:		
Balance July 1, 1905		18.5
Balance June 30, 1906		18.5
Cape Charles, act March 3, 1899:		
Balance July 1, 1905		475.0
Balance June 30, 1906		475.0
Portland, act March 3, 1903:		
Balance July 1, 1905		311.1
Balance June 30, 1906		311.1

MARINE HOSPITALS AND RELIEF.

RELIEF OF SEAMEN.

During the year 54,363 seamen were treated at the various sta tions of the Service. Of these 13,395 were treated in hospital an 40,438 were treated as out patients. The number of days hospita relief furnished seamen was 410,558.

RELIEF STATIONS.

The Service operated 21 hospitals, including one closed during th year, all of which are owned by the Government, and maintained 12 other stations where hospital and dispensary relief were furnished.

The marine hospital at Cincinnati was closed October 1, 1905, and the station changed to one of the third class in charge of an acting assistant surgeon. Pensacola, Fla., was, on May 15, 1906, made a third-class station and placed in charge of an acting assistant surgeon. On May 31, 1906, the station at Sturgeon Bay, Wis., was abolished on account of the small number of seamen treated.

AID TO OTHER BRANCHES OF THE GOVERNMENT.

Revenue-Cutter Service: 1,002 applicants for enlistment were examined, of whom 147 were rejected. Steamboat-Inspection Service: 1,389 pilots were examined as to visual capacity and 49 rejected. Life-Saving Service: 1,576 surfmen were examined and 64 rejected. Coast and Geodetic Survey: 72 employees and applicants for appointment were physically examined and 4 rejected. Light-House Service: 5 applicants for enlistment were examined and passed. Civil Service Commission: 454 applicants for appointment were physically examined and 105 rejected. Isthmian Canal Commission: 24 employees were physically examined and 1 rejected.[a]

Four hundred and fifty-four papers referred to the Bureau by the General Superintendent of the Life-Saving Service were acted upon. These papers called for an expression of opinion upon the medical evidence of disability submitted in claims for benefits under the act of May 4, 1882, and of the physical fitness of candidates for enlistment and of surfmen and keepers for reenlistment.

PHYSICAL EXAMINATIONS OF MERCHANT SEAMEN.

Physical examinations were made of 117 American merchant seamen, of whom 14 were rejected, and of 8 foreign seamen, of whom 5 were rejected.

PHYSICAL EXAMINATIONS FOR PHILIPPINE ISLANDS.

Five candidates for the Philippine civil service were examined and passed. In the Philippine Islands 701 physical examinations were made of seamen, engineers, and pilots, of whom 40 were rejected.

The total number of physical examinations made during the year was 5,348, and total number of rejections 435.

EXAMINATION OF DRUGS.

In order to determine the purity and potency of drugs purchased for issue by the purveying depot, samples of such drugs were submitted to the hygienic laboratory for examination, and reports made thereon.

PURVEYING DEPOT.

The purveying depot, removed from New York to Washington June 1, 1905, is conducted by the officer in charge of the bureau division of marine hospitals and relief.

The smaller amount expended this year by the purveying depot as compared with the previous year while at New York is largely due to the fact that during 1905 the purveying depot bought and shipped

[a] In addition to these, there were 2,121 laborers examined at Bridgeton, Barbadoes, 325 being rejected. See pages 76–77.

to the various hospital stations many hospital supplies, such a canned goods, tea, coffee, cooking utensils, clothing for the patients and various other supplies now purchased from the local contractor at the different stations. These articles purchased at stations ar not charged to the purveying depot.

Supplies purchased.

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Surgical appliances, dressings, instruments, and hospital furniture	$12,258.5
Medical supplies	10,038.0
Beds, bedding, etc	8,849.1
Hospital stores, wines, and liquors	5,089.2
Dry goods	3,040.4
Pharmaceutical appliances, etc	2,475.9
Microscopical, bacteriological, and optical apparatus, etc	2,324.5
Medical books and journals	1,443.0
Flags	767.9
Vials	455.9
Toilet paper	373.5
Rubber stamps and presses	16.8
Total cost of supplies for which orders were placed during the fiscal year	47,133.1
Operating expenses, including packing material	733.8
Total	47,867.0

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By amounts due for reimbursements for supplies issued to other services:		
Quarantine Service	$5,030.67	
Epidemic fund	144.41	
Storekeeper, Treasury	112.71	
		5,287.7
Net expenditures chargeable to Public Health and Marine-Hospital Service		42,579.2
Salaries		5,685.0
Total net expense		48,264.2
Number of requisitions filled		42
Number of packages shipped		2,63
Total weight of supplies shipped	pounds	293,41

SANATORIUM FOR CONSUMPTIVE SEAMEN, FORT STANTON, N. MEX.

Surg. P. M. Carrington submits the following statistics for the fisca year:

Patients under treatment July 1, 1905	19
Patients admitted during the year	16
	36
Patients under treatment July 1, 1906	18
Patients discharged during the year	18
	36

Ages of patients treated during the year:	
Under 25 years	69
Between 25 and 34 years	129
Between 35 and 44 years	99
Between 45 and 54 years	53
Over 54 years	16
	366
Heredity in patients treated during the year:	
History of tuberculosis in parents	87
No history of tuberculosis in parents	279
	366
Stage of disease of patients admitted:	
New classification—	
Incipient	5
Moderately advanced	40
Far advanced	122
Nontubercular	1
	168
Old classification—	
First stage	6
Second stage	40
Third stage	122
	168
Area of involvement as shown by physical examination of patients admitted during the year:	
Right lung only	3
Left lung only	1
Both lungs	163
Nontubercular	1
	168
General condition at arrival:	
Good	66
Bad	29
Very bad	73
	168
Tubercle bacilli:	
Were not found in the sputum	20
Were found in the sputum	148
	168
Record of pulmonary hemorrhages of patients admitted:	
Before arrival only	57
After arrival only	6
Both before and after arrival	7
Neither before nor after arrival	98
	168

The greatest number of patients under treatment at one time during the year was 213.

Condition of 185 patients at time of discharge:

Apparently cured	9
Arrested	27
Improved	61
Unimproved	18
Died	70
	185

Duration of stay and character of cases.

Character of case.	Longest stay.			Shortest stay.			Average stay.		
	Years.	Months.	Days.	Years.	Months.	Days.	Years.	Months.	Days.
Apparently cured	2	11	26	.....	11	17	1	6	23
Arrested	3	.....	13	.....	3	18	1	.....	15
Improved	3	9	10	.....	.....	15	.....	9	24
Unimproved	2	11	10	.....	.....	15	.....	10	17
Deaths	5	1	22	.....	.....	3	1	1	12

The patients have been divided into two classes: List A, which consists of patients who were under treatment at the beginning of the fiscal year, and list B, which consists of patients who were admitted during the year.

LIST A.—*Patients under treatment at beginning of fiscal year, classified according to nomenclature used in previous reports.*

	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged	9	20	33	9	42	113
First stage	2	.....	1	.....	1	4
Second stage	5	13	14	3	5	40
Third stage	2	7	18	6	36	69

LIST A.—*Under nomenclature adopted by the National Association for the Study and Prevention of Tuberculosis.*

	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged	9	20	33	9	42	113
Incipient	2	.....	1	.....	.....	3
Moderately advanced	7	11	13	3	3	37
Far advanced	.....	9	19	6	39	73

Patients under treatment July 1, 1905	198
Patients discharged during the year	113
Remaining under treatment July 1, 1906	85

LIST B.—*Patients admitted during the year, classified according to nomenclature used in previous reports.*

	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged	.....	7	28	9	28	72
First stage	.....	1	.....	.....	1	2
Second stage	.....	4	7	1	2	14
Third stage	.....	2	21	8	25	56

LIST B.—*Under nomenclature adopted by the National Association for the Study and Prevention of Tuberculosis.*

	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged		7	28	9	28	72
Incipient		1				1
Moderately advanced		3	7	1	3	14
Far advanced		3	21	8	25	57

Patients admitted during the year	168
Patients discharged during the year	72
Patients remaining under treatment	96

Complications.

Acute pneumonic phthisis	2	Renal calculus	1
Emphysema	5	Valvular disease of the heart	9
Hydro-thorax	2	Displacement of the heart	1
Tubercular peritonitis	1	Gastritis	4
Tubercular arthritis	2	Nervous prostration	1
Tubercular meningitis	1	Multiple neuritis	1
Tubercular laryngitis	20	Infantile paralysis	1
Tubercular adenitis	3	Sciatica	1
Tubercular testicle	1	Petit mal	1
Tubercular fistulæ	4	Pharyngitis	6
Intestinal tuberculosis	4	Otitis media	4
Syphilis	35	Nasal polypi	1
Gonorrheal arthritis	1	Malaria	3
Orchitis	1	Lupus	1
Arterio-sclerosis	1	Tinea versicolor	2
Cirrhosis of liver	1	Anemia	6
Albuminuria	7		

Length of time under treatment at sanatorium of the 185 discharged cases.

Over two years	26
Between one and two years	34
Between six and twelve months	47
Between three and six months	38
Under three months	40
Total	185

Of the 185 patients discharged during the year 8 were under treatment for less than thirty days. The results in those cases were as follows:

Unimproved	2
Died	6

During the year there were under treatment, in addition to the above, consumptive officers and employees as follows:

Under treatment July 1, 1905	16
Admitted during the year	9
	25
Still under treatment June 30, 1906	11
Left during the year	14
	25

Condition of consumptive employees at time of discharge:	
Apparently cured	2
Arrested	2
Improved	6
Unimproved	4
	14
Number of physical examinations made during the year	1,140

Station laboratory.

The following work was done in the laboratory during the year:

Sputum examinations	1,467
Urine examinations	1,152
Examinations of pus and exudates	2
Examination of tumor	1
Examinations of blood for plasmodium	3
Blood counts	6
Guinea pigs injected with sputum	5
Necropsies, including microscopical examination of organs	60

Surgeon Carrington further reports as follows:

Attention is invited to the fact that the percentage of cures must be considered in the light of the character of cases admitted and due consideration given for the lack of authority to retain patients under treatment until cured. The statistics for this year are reported under the nomenclature adopted by the National Association for the Study and Prevention of Tuberculosis. This nomenclature has been followed very strictly, and a considerable portion of the arrested cases were so reported because they were discharged a few days before the expiration of the time set by that nomenclature to warrant them as being classed as "apparently cured."

Reports received from the various medical officers of the Service as to the condition of discharged patients coming under their observation show a fair proportion of patients discharged as improved as being, so far as could be determined, perfectly well.

During the year improvements to the power plant have been authorized, and there were 15 tent houses built. These are comparatively cheap in construction and will house a large number of patients at little cost, are capable of indefinite extension, and insure the most desirable conditions to those living in them, in that they furnish protection from sun, rain, and winds and yet allow a maximum of air interchange.

The dairy herd now furnishes all the milk used at the station and some of the butter. The beef herd is also increasing satisfactorily and in the near future will supply all the beef needed. In all, counting both beef and dairy, there were at the last round-up 957 head, showing an increase for the year of 325. The natural increase of the station horses is now sufficient to supply all demands. Many chickens are raised, and these during the year supplied 1,810 dozen eggs. Eighty-eight hogs were killed for meat. Pigeons and guinea pigs were also raised for use in the laboratory. The cost of maintenance of this stock is small, as practically all the feed is raised on the place.

During the year the boundary of the reservation was surveyed by a party detailed by the Coast and Geodetic Survey. It was shown that the reservation covers over 43 square miles, and that there are about 12,000 acres of this in good grazing land outside of the present fence. This land will in time be needed for the beef herd.

When the equipment recently authorized to be purchased is installed, the station will have a reliable and efficient fire protection.

STATISTICAL TABLES.

TABLE I.—COMPARATIVE TABLE OF NUMBER TREATED—1868 TO 1906.

Operations of the Service from July 1, 1868, to June 30, 1906.

Fiscal year.	Number of sick and disabled seamen furnished relief.	Fiscal year.	Number of sick and disabled seamen furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868	11,535	1887	45,314
1869	11,356	1888	48,203
1870	10,560	1889	49,518
After reorganization:		1890	50,671
1871	14,256	1891	52,992
1872	13,156	1892	53,610
1873	13,529	1893	53,317
1874	14,356	1894	52,803
1875	15,009	1895	52,643
1876	16,808	1896	53,804
1877	15,175	1897	54,477
1878	18,223	1898	52,709
1879	20,922	1899	55,489
1880	24,860	1900	56,355
1881	32,613	1901	58,381
1882	36,184	1902	56,310
1883	40,195	1903	58,573
1884	44,761	1904	58,556
1885	41,714	1905	57,013
1886	43,822	1906	54,363

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1906.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1905.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1906.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Amount expended.	Tonnage tax collected.
Grand total	**54,363**	**1,029**	**12,896**	**13,925**	**12,401**	**493**	**1,031**	**410,558**	**40,488**	**64,178**	**5,848**	**$1,090,272.51**	**$966,421.22**
Albany, N. Y	5		5	5	4		1	97				211.55	
Apalachicola, Fla	58		28	28	26	1	1	349	30	34		662.04	
Ashland, Wis	137	2	21	23	20		3	473	114	121		645.20	
Ashtabula, Ohio	285	2	42	44	37	3	4	568	241	484	6	962.91	
Astoria, Oreg	124	4	30	34	34			642	90	156	24	1,233.75	
Baltimore, Md	1,208	48	366	414	349	16	49	16,566	794	1,166	145	24,009.58	
Bangor, Me	77		11	11	9	1	1	169	66	72	27	742.25	
Barnstable, Mass., and subports	115								115	206		219.05	
Bath, Me	25								25	41	3	311.85	
Beaufort, N. C	86								86	136	57	442.72	
Beaufort, S. C	44								44	61		88.80	
Bismarck, N. Dak	4								4	7		220.01	
Boothbay Harbor, Me	126	1	16	17	15	2		286	109	110	8	668.95	
Boston, Mass	2,893	56	701	757	686	17	54	16,245	2,136	3,823	285	30,273.18	
Bridgeport, Conn	22	2	14	16	13	1	2	452	6	13		459.00	
Brownsville, Tex												100.00	
Brunswick, Ga	272	1	50	51	46	3	2	837	221	274		1,333.30	
Buffalo, N. Y	2,346	28	479	507	465	11	31	9,437	1,839	2,793	45	15,809.05	
Burlington, Iowa	18	1	17	18	17		1	295				302.30	
Cairo, Ill	626	6	190	196	181	7	8	2,837	430	619	2	12,554.41	
Cambridge, Md	59		29	29	24	3	2	441	30	43		718.00	
Castine, Me	3								3	16		16.00	
Cedar Keys, Fla	200		1	1		1		2	199	299		12.00	
Charleston, S. C	707	2	66	68	59	1	8	933	639	888	55	4,105.71	
Chattanooga, Tenn	17		6	6	6			92	11	33		394.22	
Chicago, Ill	2,412	44	471	515	470	18	27	17,280	1,897	2,150	107	32,186.68	
Cincinnati, Ohio	374	4	94	98	93	1	4	1,133	276	430	22	5,795.17	
Cleveland, Ohio	2,065	32	483	515	466	14	35	13,639	1,550	2,231	55	18,470.84	
Corpus Christi, Tex	11	0	1	1		1		1	10	34	13	754.50	
Crisfield, Md	101								101	157	7	301.50	
Darien, Ga	18								18	25	3	183.32	
Delaware Breakwater, Del	163								163	175	38	24.22	
Detroit, Mich	1,629	29	359	388	340	11	37	12,024	1,241	2,171	53	20,450.14	
Dubuque, Iowa	25		11	11	9	1	1	210	14	18	13	677.92	
Duluth, Minn	328	3	25	28	23	4	1	498	300	330	28	648.22	
Eastport, Me	9								9	12		30.22	
Edenton, N. C	73		1	1	1			24	72	101		146.50	
Edgartown, Mass	1								1	1		2.50	

Elizabeth City, N. C.	42								42	50		300.00	
Ellsworth, Me.	5								5	22	4	300.00	
El Paso, Tex.												245.80	
Erie, Pa.	251	2	49	51	41	3	7	1,052	200	284	10	1,473.45	
Escanaba, Mich.	138	3	29	32	31		1	481	106	106		790.34	
Eureka, Cal.	93		22	22	21		1	247	71	88	11	863.33	
Evansville, Ind.	1,254	10	142	152	145	1	6	4,402	1,102	1,542	8	12,794.88	
Fernandina, Fla.	133		18	18	16	1	1	279	115	146		753.90	
Fort Stanton, N. Mex.	367	198	169	367	116	70	181	73,011				115,709.15	
Gallipolis, Ohio.	171	2	83	85	81	1	3	1,437	86	204	31	2,232.41	
Galveston, Tex.	867	11	207	218	203	6	9	4,663	649	991	83	8,980.77	
Georgetown, S. C.	265	1	63	64	64			570	201	247	3	1,591.01	
Gloucester, Mass.	279		31	31	28	1	2	604	248	427	34	1,415.40	
Government Hospital for the Insane.	41	36	5	41	1	4	36	13,376				8,627.57	
Grand Haven, Mich.	39	1	17	18	17		1	315	21	37	56	719.40	
Green Bay, Wis.	71	1	7	8	7		1	150	63	69	13	505.90	
Hartford, Conn.	17	2	15	17	14	1	2	467				418.00	
Heating apparatus.												4,754.39	
Honolulu, Hawaii.	687	12	225	237	212	5	20	6,298	450	898	20	12,909.50	
Hoquiam, Wash.	82		34	34	26	5	3	428	48	53		1,186.01	
Houghton, Mich.	24	1	11	12	11	1		363	12	14	10	781.48	
Hygienic Laboratory, Washington, D. C.												51,896.85	
Immigration Service.												95,113.68	
Jacksonville, Fla.	319	1	98	99	95	2	2	1,459	220	234	6	2,061.95	
Juneau, Alaska.	121		49	49	49			714	72	204	6	1,828.60	
Ketchikan, Alaska.	98		2	2	2			12	96	280		994.61	
Key West, Fla.	636	6	104	110	99	4	7	2,929	526	697	41	9,807.49	
La Crosse, Wis.	152	2	19	21	17	1	3	304	131	221		815.00	
Little Rock, Ark.	26		3	3	3			19	23	37		260.17	
Los Angeles, Cal.	595	8	163	171	160	6	5	2,898	424	1,030		9,319.42	
Louisville, Ky.	954	14	253	267	250	5	12	6,216	687	929	7	14,597.49	
Ludington, Mich.	16		1	1	1			4	15	28	63	169.35	
Machias, Me.	27	1	7	8	7		1	148	19	39	18	491.16	
Manistee, Mich.	150		18	18	15		3	437	132	223	21	822.53	
Manitowoc, Wis.	109		38	38	37		1	576	71	98		932.50	
Marquette, Mich.	84	1	7	8	6	2		224	76	76	20	596.00	
Marshfield, Oreg.	91	3	20	23	23			253	68	100	11	718.60	
Memphis, Tenn.	1,603	11	438	449	415	21	13	6,479	1,154	1,592	17	15,450.68	
Menominee, Mich.	43	1	4	5	4	1		127	38	50		451.45	
Milwaukee, Wis.	1,289	7	330	337	319	7	11	5,964	952	1,520	119	8,150.08	
Miscellaneous.											317	5,596.32	
Mobile, Ala.	962	30	352	382	346	14	22	9,608	580	865	87	15,099.14	
Nashville, Tenn.	77	1	9	10	10			133	67	127	9	503.38	
Natchez, Miss.	98		9	9	9			79	89	199		411.65	
New Bedford, Mass.	84	1	5	6	6			132	78	127	6	440.83	
Newbern, N. C.	420	3	58	61	60		1	770	359	722	15	1,514.29	
New Haven, Conn.	73	4	26	30	28		2	662	43	56	21	1,112.75	
New London, Conn.	117		20	20	20			236	97	102		1,112.75	
New Orleans, La.	1,496	22	426	448	381	20	47	11,297	1,048	1,626	99	27,182.05	
Newport, Ark.	48		4	4	4			48	44	69		428.14	
Newport, R. I.	80	2	38	40	33	3	4	857	40	47	24	1,643.15	

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1906—Continued.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1905.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1906.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Amount expended.	Tonnage tax collected.
Newport News, Va	276	3	36	39	36	.....	3	370	237	259	.....	$1,115.80	.....
New York, N. Y	4,826	106	1,074	1,180	1,051	43	86	35,995	3,646	6,082	919	44,080.88	.....
Nome, Alaska	70	3	17	20	17	1	2	265	50	157	.....	2,667.85	.....
Norfolk, Va	2,072	6	379	385	358	11	16	5,362	1,687	2,398	221	9,869.16	.....
Ogdensburg, N. Y	58	.....	12	12	9	1	2	348	46	80	16	694.30	.....
Oswego, N. Y	36	.....	3	3	3	.....	.....	43	33	59	.....	489.88	.....
Paducah, Ky	112	.....	9	9	9	.....	.....	80	103	275	.....	340.36	.....
Pensacola, Fla	120	7	47	54	48	2	4	724	66	124	2	984.77	.....
Philadelphia, Pa	1,271	21	316	337	315	13	9	5,763	934	1,326	316	13,323.96	.....
Philippine Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	701	.....	.....
Pittsburg, Pa	794	6	191	197	182	5	10	3,408	597	752	32	10,301.60	.....
Ponce, P. R	26	.....	6	6	6	.....	.....	47	20	30	3	60.00	.....
Port Huron, Mich	126	.....	7	7	6	1	.....	68	119	248	34	414.50	.....
Portland, Me	713	16	256	272	241	6	25	10,173	441	939	71	18,920.83	.....
Portland, Oreg	714	2	130	132	126	3	3	2,615	582	1,147	32	5,904.80	.....
Portsmouth, N. H	25	.....	5	5	5	.....	.....	67	20	20	23	271.40	.....
Port Tampa, Fla	205	.....	82	82	78	.....	4	1,262	123	249	.....	2,000.20	.....
Port Townsend, Wash	505	22	332	354	317	11	26	12,900	151	420	11	17,301.05	.....
Providence, R. I	565	5	102	107	100	5	2	1,691	458	1,070	43	3,528.73	.....
Purveying depot	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55,823.24	.....
Railroad transportation, freight charges, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,196.55	.....
Repairs and preservation public buildings	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62,190.22	.....
Revenue-cutter vessels, cruises of	404	.....	.....	.....	.....	.....	.....	.....	404	813	.....	8,519.18	.....
Richmond, Va	35	2	9	11	11	.....	.....	156	24	58	.....	455.44	.....
Rockland, Me	177	.....	.....	.....	.....	.....	.....	.....	177	447	19	591.01	.....
Sag Harbor, N. Y	2	.....	.....	.....	.....	.....	.....	.....	2	2	.....	4.83	.....
Saginaw, Mich	196	1	36	37	35	.....	2	465	159	199	6	775.35	.....
Salaries, Surgeon-General's Office	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41,162.50	.....
Salem, Mass	17	.....	.....	.....	.....	.....	.....	.....	17	17	.....	17.00	.....
San Diego, Cal	139	.....	25	25	25	.....	.....	301	114	211	.....	2,850.83	.....
Sandusky, Ohio	81	1	6	7	7	.....	.....	138	74	102	6	346.73	.....
San Francisco, Cal	2,894	98	1,038	1,136	1,011	46	79	37,784	1,758	3,473	202	43,573.07	.....
San Juan, P. R	281	7	113	120	111	.....	9	2,613	161	233	41	2,430.95	.....
St. Louis, Mo	1,147	9	199	208	188	8	12	5,288	939	1,339	34	16,558.70	.....
St. Paul, Minn	31	2	10	12	12	.....	.....	220	19	35	6	441.98	.....
Sault Ste. Marie, Mich	241	4	98	02	96	4	2	1,194	139	156	28	1,856.51	.....
Savannah, Ga	892	11	217	22	215	1	12	4,290	664	938	39	7,244.80	.....

Seattle, Wash.	1,310	7	189	196	185	5	6	3,759	1,114	2,062	163	5,193.59		
Sheboygan, Wis.	26	1	12	13	12		1	315	13	14	10	629.25		
Shreveport, La.	3		1	1	1			2	2	4		670.33		
Sitka, Alaska	37		10	10	9		1	194	27	27		635.55		
Solomons, Md.	328		11	11	11			75	317	374		595.95		
Sturgeon Bay, Wis.	8								8	9	42	279.90		
Superior, Wis.	396	3	104	107	92	5	10	1,911	289	319		1,883.70		
Tacoma, Wash.	118		25	25	25			403	93	113	1	1,072.80		
Tappahannock, Va., and subports	186	1	141	142	137	5		1,327	44	46		2,060.95		
Toledo, Ohio	481	2	94	96	93	3		1,408	385	913	21	1,457.60		
Traveling expenses												6,610.26		
Vicksburg, Miss	117	4	67	71	68	2	1	960	46	76		1,503.47		
Vineyard Haven, Mass	266	7	93	100	87	2	11	3,761	166	184	8	10,088.69		
Washington, D. C	152	1	26	27	23	2	2	769	125	211	22	1,904.75		
Washington, D. C., Bureau												31,499.64		
Washington, N. C	150		24	24	22	1	1	296	126	139		475.17		
Wheeling, W. Va.	28		28	28	28			316				638.00		
Wilmington, N. C.	249	7	89	96	84	2	10	3,843	153	163	58	9,697.64		
Wiscasset, Me	1								1	14		14.00		
Cape Charles Quarantine	13								13	19	1			
Cape Fear Quarantine	17								17	32	31			
Gulf Quarantine	63		59	59	59			1,116	4	4	5			
Reedy Island Quarantine	5		5	5	4	1		51						
San Francisco Quarantine	92		13	13	11	2		110	79	91				
Santa Rosa Quarantine	6	1	5	6	6			34						

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS MADE BY OFFICERS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1906, EXCLUSIVE OF ALIEN IMMIGRANTS.

Summary of examinations and causes of rejection.	Total.	Pilots.	Merchant seamen.	Revenue-cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Light-House Service.	Foreign seamen.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Summary of examinations:											
Total number examined	5,348	1,389	117	1,002	1,576	72	5	8	454	[a]24	701
Number passed	4,913	1,340	103	849	1,512	68	5	3	349	23	661
Number rejected	435	49	14	153	64	4	0	5	105	1	40
Causes of rejections.											
Acne	1			1							
Albuminaria	1			1							
Alcoholism	1								1		
Ankylosis wrist	1			1							
Atrophy left arm	1			1							
Bronchitis:											
Chronic	11			5	6						
Acute	7			6	1						
Cardiac hypertrophy	1				1						
Color blindness	65	28	2	19	4						12
Condyloma of penis	3			3							
Defective teeth	5			3	1	1					
Defective vision	79	20		22	10				4		23
Failed to return for examination	2			2							
Fever	1				1						
Fistula in ano	2			1	1						
Fracture of ulna	1				1						
Gonorrhea	18			16				1			1
Heart:											
Abnormal action of	6			5	1						
Dilatation of	2				1				1		
Mitral insufficiency	3			1	1				1		
Mitral regurgitation	11			6	3				2		
Valvular disease of	13			5	8						
Hemorrhoids	3			2				1			
Hernia	15		1	8	5				1		
Hydrocele	2			1					1		
Hypertrophied tonsils	1			1							
Inflammation of eyelid	2		1	1							
Inflammation of lymph glands	1		1								
Knock-knee	1			1							
Locomotor ataxia	3				3						
Loss of finger	1			1							
Loss of limb	1								1		
Lungs, emphysematous	1				1						
Myalgia	2		2								
Old age	1				1						
Ophthalmia	1				1						
Papilloma hands	1			1							
Poduculi	1			1							
Piles	2				1				1		
Pleurisy	1				1						
Poor physique	5			3							2
Prolapse of rectum	1		1								
Pulmonary hemorrhage	2			1	1						
Presystolic murmur	1				1						
Rheumatism	3			1	1			1			
Ribs, contusion of	2		1	1							
Rodent ulcer	1				1						
Rupture	1								1		
Scabies	5			5							
Soft chancre	2			1				1			
Spine, curvature of	1			1							
Stiff wrist	1		1								
Strain of muscles of leg	1				1						
Syphilis	9	1	2	5				1			
Testicle, atrophy of	1			1							
Tinia versicolor	2			2							
Tuberculosis	11			2	1	1			4	1	2
Ulcer of leg	1		1								
Ulcer of throat	1			1							
Under development	89			1	1	1			86		
Varicocele	9			8					1		
Varicose veins	10			5	4	1					
Venereal ulcer	1		1								

[a] In addition to these there were 2,121 laborers examined at Bridgeton, Barbados, 325 being rejected.

See pages 76–77.

TABLE IV.—STATEMENT, BY DISTRICTS, OF THE NUMBER OF PATIENTS TREATED DURING THE YEAR ENDED JUNE 30, 1906.

District.	Total cases.	Patients in hospital July 1, 1905.	Admitted during the year.	Total number cases treated in hospital.	Discharged.	Died.	Patients in hospital June 30,1906.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.
Total	**54,363**	**1,029**	**12,896**	**13,925**	**12,401**	**493**	**1,031**	**410,558**	**40,438**	**64,178**
Atlantic	20,213	347	4,421	4,768	4,274	147	347	129,548	15,445	24,441
West Indies	307	7	119	126	117	0	9	2,660	181	263
Gulf	4,558	76	1,249	1,325	1,182	49	94	30,837	3,233	4,923
Ohio	3,781	37	815	852	804	13	35	17,217	2,929	4,292
Mississippi	3,895	35	967	1,002	923	40	39	16,759	2,893	4,212
Great Lakes	13,065	169	2,763	2,932	2,663	89	180	69,502	10,133	14,884
Pacific	7,661	345	2,255	2,600	2,146	147	307	136,426	5,061	10,119
Pacific islands	687	12	225	237	212	5	20	6,298	450	898
Quarantine stations	196	1	82	83	80	3	0	1,311	113	146

TABLE V.—RATIO OF PATIENTS TREATED IN HOSPITAL IN EACH DISTRICT.

District.	Per cent of patients treated in hospital.	District.	Per cent of patients treated in hospital.
Atlantic	23.59	Great Lakes	22.44
West Indies	41.04	Pacific	33.94
Gulf	29.07	Pacific islands	34.50
Ohio	22.53	Quarantine stations	42.35
Mississippi	25.73		

TABLE VI.—AVERAGE DURATION OF TREATMENT IN HOSPITAL IN EACH DISTRICT.

District.	Average number of days relief furnished to each patient.	District.	Average number of days' relief furnished to each patient.
Atlantic	27.17	Great Lakes	23.70
West Indies	21.11	Pacific	52.47
Gulf	23.27	Pacific islands	26.55
Ohio	20.21	Quarantine stations	15.80
Mississippi	16.73		

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered	Improved.	Not improved.	Died	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
TOTAL CASES	**1,029**	**12,896**	**7,401**	**4,588**	**414**	**493**	**1,029**	**40,438**	**54,363**
General diseases	**496**	**5,251**	**2,865**	**1,947**	**193**	**254**	**488**	**15,948**	**21,695**
Smallpox	1	29	24	1	4	....	1	6	36
Cowpox	1	2	2	1	.....	.....	.....	297	300
Chicken pox	.....	4	4	.....	.....	.....	.....	5	9
Measles	.....	36	30	2	2	....	2	6	42
Rubella	.....	1	.....	1	.....	....	.....	.....	1
Scarlet fever	.....	4	3	.....	1	....	.....	2	6
Typhus fever	.....	1	.....	.....	.....	1	.....	.....	1
Plague	1	2	.....	2	.....	1	.....	.....	3
Dengue	.....	19	15	4	.....	.....	.....	18	37
Influenza	.....	206	169	31	3	1	2	831	1,037
Mumps	1	26	18	8	.....	....	1	20	47
Diphtheria	.....	12	9	.....	3	.....	.....	.....	12
Cerebro spinal fever	.....	6	.....	.....	.....	5	1	.....	6
Simple-continued fever	1	28	27	1	.....	.....	1	26	55
Enteric fever	50	407	331	35	4	41	46	34	491
Choleraic diarrhea	.....	6	6	.....	.....	.....	.....	10	16
Epidemic diarrhea	.....	.....	.....	.....	.....	.....	.....	30	30
Dysentery	10	85	67	22	.....	3	3	122	217
Yellow fever	.....	53	48	.....	.....	5	.....	.....	53
Beriberi	2	9	7	3	.....	....	1	1	12
Malarial fever:									
Intermittent	23	823	714	101	8	3	20	1,601	2,537
Remittent	14	258	204	56	4	3	5	136	408
Phagedena	.....	2	1	.....	.....	....	1	.....	2
Sloughing phagedena	.....	1	1	.....	.....	....	.....	.....	1
Hospital gangrene	.....	1	.....	.....	.....	1	.....	.....	1
Erysipelas	4	54	38	14	1	1	4	22	80
Pyæmia	.....	2	1	.....	.....	1	.....	1	3
Septicæmia	.....	3	2	.....	.....	1	.....	6	9
Tubercle	235	587	27	345	86	140	224	247	1,069
Leprosy	.....	.....	.....	.....	.....	.....	.....	2	2
Syphilis:									
Primary	2	81	11	68	.....	....	4	334	417
Secondary	44	520	14	486	17	4	43	3,062	2,626
Tertiary	.....	9	.....	8	1	....	.....	74	83
Gonorrhea	40	600	279	302	18	....	41	4,530	5,170
Diseases dependent on animal parasites	.....	71	49	18	2	....	2	460	531
Diseases dependent on vegetable parasites	.....	7	5	2	.....	.....	.....	90	97
Effects of animal poisons: Decayed and poisonous food	.....	6	6	.....	.....	.....	.....	4	10
Effects of vegetable poisons:									
Coal gas	.....	1	1	.....	.....	.....	.....	.....	1
Opium	.....	4	1	2	1	.....	.....	.....	4
Tobacco	.....	2	1	1	.....	.....	.....	5	7
Cocaine	.....	1	.....	.....	.....	.....	1	.....	1
Rhus toxicodendron	.....	2	1	1	.....	.....	.....	5	7
Methylic alcohol	.....	.....	.....	.....	.....	.....	.....	1	1
Larkspur	.....	1	1	.....	.....	.....	.....	.....	1
Capsicum	.....	.....	.....	.....	.....	.....	.....	1	1
Effects of inorganic poisons:									
Copaiba	.....	1	1	.....	.....	.....	.....	2	3
Lead	.....	3	1	1	1	....	.....	3	6
Mercury	1	1	1	1	.....	.....	.....	1	3
Sweet spirits nitre	.....	1	1	.....	.....	.....	.....	.....	1
Effects of the presence of foreign bodies	.....	6	6	.....	.....	.....	.....	21	27
Effects of mechanical injuries	.....	3	2	.....	.....	.....	1	14	17
Effects of heat	.....	5	5	.....	.....	.....	.....	4	9
Effects of cold	1	1	2	.....	.....	.....	.....	.....	2
Effects of chemical agents	.....	5	4	1	.....	.....	.....	6	11
Scurvy	.....	1	.....	1	.....	.....	.....	.....	1
Alcoholism	7	238	203	23	2	11	6	245	490
Rheumatic fever	6	132	83	39	.....	3	13	31	169
Rheumatism	36	707	380	303	11	4	45	2,695	3,438
Gout	.....	.....	.....	.....	.....	.....	.....	19	19
Osteoarthritis	1	2	.....	1	.....	....	2	3	6

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary
Cyst:									
Traumatic	.....	1	1	.....	.....	.....	.....	2	3
Mucous	.....	3	1	2	.....	.....	.....	6	9
Sebaceous	1	7	8	.....	.....	.....	.....	15	23
Bursal	.....	.....	.....	.....	.....	.....	.....	4	4
Chalazion	.....	1	1	.....	.....	.....	.....	2	3
New growth, nonmalignant	2	36	25	6	4	.....	3	135	173
New growth, malignant	4	42	6	9	11	12	8	18	64
Anæmia	1	19	3	12	2	2	1	29	49
Idiopathic anæmia	.....	1	.....	.....	.....	.....	1	.....	1
Purpura	.....	.....	.....	.....	.....	.....	.....	2	2
Leuchæmia	.....	1	.....	.....	.....	1	.....	.....	1
Hodgkin's disease	.....	1	.....	.....	.....	1	.....	.....	1
Hæmophilia	.....	1	.....	1	.....	.....	.....	1	2
Diabetes mellitus	.....	9	.....	7	.....	2	.....	19	28
Diabetes insipidus	.....	1	.....	1	.....	.....	.....	15	16
Congenital malformations	.....	9	3	5	.....	.....	1	3	12
Debility	6	37	18	17	3	2	3	563	606
Old age	1	3	.....	.....	1	.....	3	7	11
Local diseases	**393**	**5,313**	**2,926**	**1,972**	**191**	**194**	**423**	**19,489**	**25,195**
DISEASES OF THE NERVOUS SYSTEM	113	313	86	164	35	24	117	898	1,324
Of the nerves—									
Inflammation—									
Neuritis	3	33	14	18	1	.....	3	45	81
Multiple neuritis	1	7	2	3	1	.....	2	2	10
Of the spinal cord and membranes—membranes—									
Inflammation—									
Of dura mater	.....	1	.....	.....	.....	1	.....	.....	1
Of pia mater and arachnoid	.....	1	.....	1	.....	.....	.....	.....	1
Of the spinal cord and membranes—cord—									
Inflammation—									
Diffuse	2	5	.....	4	1	1	1	1	8
Local	.....	1	.....	1	.....	.....	.....	.....	1
Degeneration—									
Of anterior cornua	2	2	.....	2	.....	.....	2	.....	4
Of lateral columns	5	3	.....	1	.....	.....	7	1	9
Of posterior columns	18	28	.....	11	7	5	23	13	59
Of the brain and its membranes—membranes—									
Inflammation of dura mater	.....	2	.....	.....	.....	2	.....	.....	2
Hæmorrhage	2	1	.....	1	1	1	.....	1	4
Of the brain and its membranes—brain—									
Inflammation	.....	1	.....	.....	.....	1	.....	.....	1
Sclerosis	2	.....	.....	.....	1	.....	1	.....	2
Softening	.....	1	.....	1	.....	.....	.....	1	2
Hæmorrhage	5	11	.....	8	2	.....	6	7	23
Hyperæmia	.....	1	.....	.....	.....	1	.....	5	6
Functional nervous disorders with other diseases of undetermined nature—									
Apoplexy	1	7	.....	4	.....	2	2	2	10
Paralysis—									
Paraplegia	4	9	.....	9	1	.....	3	1	14
Hemiplegia	14	26	2	15	1	3	19	12	52
Local paralysis	2	3	1	3	.....	.....	1	16	21
Incomplete paralysis	3	2	1	2	1	.....	1	2	7
Paralysis from acute disease	.....	1	.....	.....	.....	.....	1	.....	1
Paralysis agitans	.....	3	.....	2	1	.....	.....	3	6
Chorea	.....	1	.....	.....	1	.....	.....	.....	1
Spasm	.....	12	10	2	.....	.....	.....	19	31
Torticollis	1	.....	.....	1	.....	.....	.....	3	4
Eclampsia uræmic	.....	1	.....	.....	.....	1	.....	.....	1
Epilepsy	.....	19	5	10	3	.....	1	21	40
Vertigo	.....	7	1	5	.....	1	.....	14	21
Headache	.....	4	4	.....	.....	.....	.....	115	119

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE NERVOUS SYSTEM—Continued.									
Functional nervous disorders with other diseases of undetermined nature—Continued.									
Anæsthesia	.....	.....	.....	.....	.....	....	.....	4	4
Neuralgia	2	59	33	25	.....	....	3	416	477
Facial hemiatrophy	.....	1	.....	1	.....	....	.....	.....	1
Hysteria	1	1	1	1	.....	....	.....	.....	2
Aphasia	.....	2	.....	2	.....	....	.....	2	4
Somnambulism	.....	.....	.....	.....	.....	....	.....	1	1
Nervous weakness	.....	29	7	16	5	....	1	182	211
Mental diseases—									
Mania	29	10	1	10	7	1	20	1	40
Melancholia	1	3	3	1	.....	....	.....	7	11
Dementia	12	9	.....	.....	.....	5	16	1	22
Mental stupor	.....	1	1	.....	.....	....	.....	.....	1
General paralysis of the insane	2	1	.....	.....	.....	....	3	1	4
Delusional insanity	2	1	.....	.....	1	....	2	.....	3
DISEASES OF THE EYE	11	153	56	71	25	....	12	526	690
Conjunctivitis—									
Catarrhal—									
Granular	.....	33	1	24	6	....	2	.....	33
Acute	3	37	19	10	10	....	1	357	397
Chronic	.....	.....	.....	.....	.....	....	.....	3	3
Purulent	.....	2	1	.....	.....	....	1	1	3
Ecchymosis of conjunctiva	.....	.....	.....	.....	.....	....	.....	7	7
Chronic hyperæmia of conjunctiva	.....	.....	.....	.....	.....	....	.....	1	1
Keratitis	2	9	4	6	1	....	.....	7	18
Ulceration of cornea	.....	10	5	5	.....	....	.....	12	22
Hemorrhage of retina	.....	.....	.....	.....	.....	....	.....	4	4
Opacity of cornea	.....	.....	.....	.....	.....	....	.....	2	2
Scleritis	.....	.....	.....	.....	.....	....	.....	1	1
Iritis	2	32	17	14	1	....	2	29	63
Hemorrhage in vitreous humour	.....	.....	.....	.....	.....	....	.....	1	1
Choroiditis	.....	2	.....	1	1	....	.....	2	4
Glaucoma	.....	5	2	2	1	....	.....	3	8
Optic neuritis	1	.....	.....	1	.....	....	.....	2	3
Atrophy and degeneration of optic nerve or papilla	.....	2	.....	1	1	....	.....	.....	2
Retinitis	.....	2	.....	1	1	....	.....	.....	2
Lenticular cataract	2	8	3	1	1	....	5	8	18
Capsular cataract	.....	1	1	.....	.....	....	.....	4	5
Degeneration and atrophy of retina	.....	.....	.....	.....	.....	....	.....	1	1
Panophthalmitis	.....	3	1	1	.....	....	1	.....	3
Hemianopsia	.....	.....	.....	.....	.....	....	.....	1	1
Amblyopia	.....	.....	.....	.....	.....	....	.....	6	6
Ametropia	.....	1	.....	.....	1	....	.....	5	6
Muscæ volitantes	.....	.....	.....	.....	.....	....	.....	1	1
Hypopyon	.....	1	.....	.....	1	....	.....	.....	1
Neuralgia of eyeball	.....	.....	.....	.....	.....	....	.....	1	1
Inflammation lachrymal gland	.....	.....	.....	.....	.....	....	.....	2	2
Dacryo cystitis	.....	1	.....	1	.....	....	.....	2	3
Stricture of lachrymal glands	.....	.....	.....	.....	.....	....	.....	1	1
Obstruction of nasal duct	.....	.....	.....	.....	.....	....	.....	3	3
Epiphora	.....	.....	.....	.....	.....	....	.....	1	1
Blepharitis marginalis	.....	.....	.....	.....	.....	....	.....	11	11
Sty	.....	1	.....	1	.....	....	.....	31	32
Abscess of eyelid	.....	1	1	.....	.....	....	.....	8	9
Ecchymosis of eyelid	.....	.....	.....	.....	.....	....	.....	2	2
Trichiasis	.....	.....	.....	.....	.....	....	.....	1	1
Oedema of eyelid	.....	.....	.....	.....	.....	....	.....	2	2
Ectropion	.....	1	.....	1	.....	....	.....	1	2
Ptosis	.....	1	1	.....	.....	....	.....	1	2
Abscess lachrymal sac	1	.....	.....	1	.....	....	.....	.....	1
Blepharospasm	.....	.....	.....	.....	.....	....	.....	2	2

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE EAR	5	50	32	16	4	2	1	255	310
Inflammation of the external meatus—									
Acute	.....	4	3	1	.....	.....	.....	20	24
Chronic	.....	.....	.....	.....	.....	.....	.....	7	7
Abscess	.....	2	2	.....	.....	.....	.....	7	9
Accumulation in external meatus of wax or epidermis	.....	3	3	.....	.....	.....	.....	89	92
Inflammation of the middle ear—									
Nonsuppurative	1	14	7	6	1	.....	1	38	53
Suppurative	3	20	13	7	2	1	.....	49	72
Within the mastoid cells	1	3	3	.....	.....	1	.....	3	7
Ulceration of membrana tympani	.....	.....	.....	.....	.....	.....	.....	3	3
Perforation of membrana tympani	.....	.....	.....	.....	.....	.....	.....	5	5
Necrosis of ossicles	.....	1	.....	1	.....	.....	.....	4	5
Anchylosis of ossicles	.....	1	1	.....	.....	.....	.....	.....	1
Obstruction of Eustachian tube	.....	.....	.....	.....	.....	.....	.....	5	5
Tinnitus	.....	.....	.....	.....	.....	.....	.....	5	5
Deafness	.....	2	.....	1	1	.....	.....	15	17
DISEASES OF THE NOSE	.....	26	13	11	.....	.....	2	337	363
Inflammation of soft parts	.....	9	4	5	.....	.....	.....	301	310
Hypertrophy of skin of nose	.....	1	1	.....	.....	.....	.....	.....	1
Diseases of septum, hæmatoma	.....	2	1	1	.....	.....	.....	2	4
Epistaxis	.....	7	4	1	.....	.....	2	9	16
Inflammation of the accessory sinuses	.....	3	1	2	.....	.....	.....	6	9
Inflammation of the naso-pharynx	.....	3	2	1	.....	.....	.....	21	24
Hypertrophy of pharyngeal tonsil	.....	1	.....	1	.....	.....	.....	.....	1
DISEASES OF THE CIRCULATORY SYSTEM	43	330	66	200	13	55	39	399	772
Pericarditis	.....	4	2	2	.....	.....	.....	4	8
Endocarditis	.....	6	.....	4	.....	1	1	4	10
Valvular disease—									
Aortic	7	43	.....	35	3	6	6	19	69
Mitral	11	123	5	81	3	26	19	133	267
Aortic and mitral	3	26	.....	14	1	11	3	25	54
Tricuspid	.....	1	.....	.....	.....	1	.....	.....	1
Degeneration of heart, fatty	.....	2	1	.....	.....	.....	1	4	6
Myocarditis	.....	1	1	.....	.....	.....	.....	.....	1
Rupture aortic aneurism	.....	1	.....	.....	.....	1	.....	.....	1
Hypertrophy of heart	.....	4	.....	4	.....	.....	.....	4	8
Dilatation of heart	1	11	1	8	.....	1	2	16	28
Rupture	.....	.....	.....	.....	.....	.....	.....	1	1
Angina pectoris	2	3	.....	4	.....	.....	1	3	8
Disordered action of the heart	.....	1	.....	1	.....	.....	.....	1	2
Abnormal rapidity	.....	3	1	2	.....	.....	.....	29	32
Irregularity	.....	8	.....	6	.....	.....	2	32	40
Arteritis	2	8	.....	6	2	1	1	3	13
Degeneration of arteries, arterio-capillary fibrosis	2	6	.....	5	.....	1	2	5	13
Aneurism of arteries	3	11	4	5	2	3	.....	6	20
Dilatation of capillaries of leg	.....	1	.....	.....	1	.....	.....	.....	1
Obstruction of arteries—									
Thrombosis	1	1	1	1	.....	.....	.....	2	4
Embolism	2	1	1	1	.....	1	.....	1	4
Phlebitis	3	7	7	3	.....	.....	.....	4	14
Varix	6	55	42	17	1	.....	1	99	160
Rupture of artery	.....	2	.....	1	.....	1	.....	.....	2
Raynaud's disease	.....	.....	.....	.....	.....	.....	.....	1	1
Obstruction of vein	.....	1	.....	.....	.....	1	.....	2	3
Traumatic aneurism	.....	1	.....	.....	.....	1	.....	.....	1
DISEASES OF THE RESPIRATORY SYSTEM	31	676	362	245	22	45	33	3,073	3,780
Hay fever	.....	1	1	.....	.....	.....	.....	17	18
Emphysema	2	6	1	5	.....	.....	2	5	13
Inflammation of mucous membrane of larynx—									
Catarrhal, acute	.....	8	3	3	2	.....	.....	68	76
Catarrhal, chronic	.....	1	.....	.....	.....	.....	1	5	6
Œdema of larynx	.....	1	.....	1	.....	.....	.....	.....	1

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE RESPIRATORY SYSTEM—Continued.									
Dilatation of bronchi	.....	1	.....	1	.....	.....	.....	.....	1
Bronchitis—									
Catarrhal, acute	8	221	148	71	4	3	3	2,332	2,561
Catarrhal, chronic	2	66	13	41	7	.....	7	334	402
Vomica	.....	.....	.....	.....	.....	.....	.....	1	1
Spasmodic asthma	3	43	6	37	.....	1	2	86	132
Congestion of lung	.....	6	5	.....	.....	1	.....	32	38
Hæmorrhage of lung, hæmoptysis	.....	5	1	4	.....	.....	.....	11	16
Pneumonia	4	157	105	20	1	27	8	6	167
Broncho-pneumonia	.....	11	5	5	.....	1	.....	3	14
Abscess of lung	.....	1	.....	.....	.....	1	.....	.....	1
Chronic interstitial inflammation	.....	1	.....	1	.....	.....	.....	1	2
Phthisis—									
Acute	2	10	8	3	1	.....	.....	23	35
Chronic	.....	14	1	8	2	3	.....	7	21
Tubercular	.....	8	.....	5	2	1	.....	2	10
Pleurisy—									
Acute	2	93	57	27	3	3	5	90	185
Chronic	4	16	6	9	.....	2	3	7	27
Grinder's asthma	.....	.....	.....	.....	.....	.....	.....	1	1
Empyema	4	3	2	2	.....	1	2	4	11
Adhesions of pleura	.....	1	.....	1	.....	.....	.....	1	2
Tracheitis	.....	1	.....	1	.....	.....	.....	36	37
Œdema of lungs	.....	1	.....	.....	.....	1	.....	1	2
DISEASES OF THE DIGESTIVE SYSTEM	46	1,364	940	333	40	29	68	6,362	7,772
Inflammation of the lips	.....	.....	.....	.....	.....	.....	.....	5	5
Ulceration of the lips	.....	.....	.....	.....	.....	.....	.....	7	7
Fissure of the lips	.....	.....	.....	.....	.....	.....	.....	2	2
Inflammation of the mouth	.....	2	.....	2	.....	.....	.....	33	35
Ulceration of the mouth	1	5	3	1	.....	1	1	18	24
Absorption of dentine and cementum	.....	.....	.....	.....	.....	.....	.....	1	1
Tooth out of place in jaw	.....	.....	.....	.....	.....	.....	.....	1	1
Suppuration of the dental pulp	.....	1	.....	1	.....	.....	.....	4	5
Caries of dentine and cementum	.....	1	.....	.....	.....	1	.....	99	100
Inflammation of dental periosteum	.....	.....	.....	.....	.....	.....	.....	6	6
Abscess of dental periosteum	.....	10	5	4	1	.....	.....	35	45
Suppuration of alveoli	.....	3	3	.....	.....	.....	.....	11	14
Hypertrophy of gums	.....	.....	.....	.....	.....	.....	.....	1	1
Caries of the alveoli	.....	1	.....	1	.....	.....	.....	20	21
Toothache	.....	1	1	.....	.....	.....	.....	65	66
Necrosis of alveoli	.....	.....	.....	.....	.....	.....	.....	1	1
Atrophy of gums	.....	.....	.....	.....	.....	.....	.....	1	1
Inflammation of the tongue	.....	.....	.....	.....	.....	.....	.....	4	4
Ulceration of the tongue	.....	.....	.....	.....	.....	.....	.....	3	3
Sore throat	.....	20	15	4	.....	1	.....	151	171
Ulceration of tonsils	.....	2	1	1	.....	.....	.....	1	3
Inflammation of tonsils—									
Follicular	2	108	91	19	.....	.....	.....	455	565
Suppuration	.....	40	31	8	.....	1	.....	29	69
Hypertrophy of tonsils	.....	4	1	3	.....	.....	.....	3	7
Elongated uvula	.....	.....	.....	.....	.....	.....	.....	2	2
Inflammation of salivary glands	.....	2	1	1	.....	.....	.....	5	7
Salivation	.....	6	3	3	.....	.....	.....	8	14
Inflammation of the pharynx—									
Catarrhal	.....	17	11	5	.....	.....	1	202	219
Granular	.....	.....	.....	.....	.....	.....	.....	1	1
Follicular	.....	6	6	.....	.....	.....	.....	11	17
Salivary calculus	.....	.....	.....	.....	.....	.....	.....	1	1
Internal strangulation	.....	1	1	.....	.....	.....	.....	.....	1
Ulceration of pharynx	2	2	2	2	.....	.....	.....	2	6
Dysphagia	.....	.....	.....	.....	.....	.....	.....	1	1
Stricture of œsophagus	.....	1	.....	.....	.....	1	.....	.....	1
Inflammation of the stomach:									
Catarrhal—									
Acute	6	116	76	36	2	3	5	399	521
Chronic	4	24	5	19	2	1	1	64	92
Hæmorrhage of intestines	.....	.....	.....	.....	.....	.....	.....	1	1

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Ulceration of the stomach—									
Superficial	1	8	4	4	.....	1	.....	8	17
Perforating	.....	1	1	.....	.....	.....	.....	.....	1
Hæmorrhage of the stomach	.....	2	2	.....	.....	.....	.....	2	4
Hyperæmia	.....	.....	.....	.....	.....	.....	.....	2	2
Dilatation of the stomach	1	4	1	3	.....	.....	1	6	11
Indigestion	4	92	60	25	5	.....	6	1,550	1,646
Pyrosis	.....	.....	.....	.....	.....	.....	.....	41	41
Nausea	.....	.....	.....	.....	.....	.....	.....	2	2
Vomiting	.....	.....	.....	.....	.....	.....	.....	13	13
Gastralgia	.....	5	3	1	1	.....	.....	26	31
Heartburn	.....	.....	.....	.....	.....	.....	.....	8	8
Loss of appetite	.....	2	1	1	.....	.....	.....	41	43
Inflammation of hernial sac	.....	1	1	.....	.....	.....	.....	1	2
Fistula of intestines	.....	2	2	.....	.....	.....	.....	.....	2
Inflammation of the intestines—									
Enteritis	.....	50	40	6	.....	1	3	92	142
Typhlitis	3	107	74	19	2	4	11	24	134
Colitis	.....	34	14	19	1	.....	.....	41	75
Catarrhal	2	47	35	13	.....	.....	1	64	113
Ulceration of the intestines	.....	1	.....	.....	.....	.....	1	.....	1
Volvulus	.....	2	1	.....	.....	1	.....	.....	2
Fæcal accumulation	.....	4	4	.....	.....	.....	.....	7	11
Hernia	7	186	140	21	17	3	12	577	770
Obstruction of the intestines	.....	4	3	.....	.....	.....	1	.....	4
Perforation of appendix	.....	1	.....	.....	.....	1	.....	.....	1
Intestinal dyspepsia	.....	3	3	.....	.....	.....	.....	33	36
Constipation	.....	26	24	1	1	.....	.....	997	1,023
Colic	.....	19	18	1	.....	.....	.....	37	56
Diarrhœa	.....	89	72	12	1	1	3	568	657
Enteralgia	.....	2	2	.....	.....	.....	.....	5	7
Inflammation of the rectum	.....	2	2	.....	.....	.....	.....	5	7
Ulceration of the anus	.....	2	1	1	.....	.....	.....	1	3
Periproctitis, abscess	3	28	17	12	.....	.....	2	19	50
Fissure of the anus	.....	1	1	.....	.....	.....	.....	12	13
Fistula in ano	1	56	37	14	2	.....	4	30	87
Prolapse of the rectum	1	2	2	.....	.....	.....	1	2	5
Stricture of rectum	.....	.....	.....	.....	.....	.....	.....	1	1
Rectocele	.....	.....	.....	.....	.....	.....	.....	1	1
Piles—									
Internal	3	27	18	8	2	.....	2	96	126
External	.....	26	17	7	1	.....	1	122	148
Mixed	2	25	18	7	.....	1	1	26	53
Pruritus ani	.....	2	1	1	.....	.....	.....	11	13
Inflammation of the liver—									
Acute	1	13	5	7	1	1	.....	43	57
Acute abscess	.....	1	.....	.....	.....	.....	1	.....	1
Chronic	1	15	1	10	.....	3	2	16	32
Hyperæmia of the liver	.....	17	10	6	.....	.....	1	123	140
Acute yellow atrophy of liver	.....	1	.....	.....	.....	1	.....	.....	1
Plugging of hepatic duct and gall bladder	.....	1	1	.....	.....	.....	.....	3	4
Perforation of gall bladder	.....	1	.....	1	.....	.....	.....	.....	1
Inflammation of pancreas	.....	1	1	.....	.....	.....	.....	1	2
Atrophy of the liver	.....	1	.....	1	.....	.....	.....	1	2
Hypertrophy of the liver	.....	1	1	.....	.....	.....	.....	3	4
Jaundice	.....	20	15	5	.....	.....	.....	32	52
Inflammation of hepatic ducts and gall bladder	1	36	18	15	.....	.....	4	22	59
Calculi	.....	8	6	2	.....	.....	.....	7	15
Biliary colic	.....	1	1	.....	.....	.....	.....	2	3
Inflammation of the peritonæum	.....	4	1	1	.....	2	.....	1	5
Dropsy	.....	3	2	1	.....	.....	.....	3	6
Accumulation of bile	.....	4	4	.....	.....	.....	.....	11	15
Inflammation of capsule of liver	.....	1	.....	1	.....	.....	.....	.....	1
Tympanites	.....	.....	.....	.....	.....	.....	.....	1	1

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE LYMPHATIC SYSTEM.	23	384	208	159	12	....	28	485	892
Abscess of spleen	.....	.....	.....	.....	.....	.....	.....	1	1
Atrophy of spleen	.....	1	.....	1	.....	.....	.....	.....	1
Hypertrophy of spleen	.....	1	.....	1	.....	.....	.....	2	3
Lardaceous disease of lymphatic glands	.....	1	.....	1	.....	.....	.....	.....	1
Inflammation of lymph glands	15	319	174	126	11	....	23	394	728
Suppuration	7	49	28	22	1	....	5	46	102
Hypertrophy of lymph glands	1	3	1	3	.....	.....	.....	4	8
Inflammation of lymphatics	.....	9	4	4	.....	.....	1	7	16
Suppuration	.....	1	1	.....	.....	.....	.....	.....	1
DISEASES OF THE THYROID BODY	1	2	.....	3	.....	.....	.....	25	28
Goitre	1	2	.....	3	.....	.....	.....	7	10
DISEASES OF THE SUPRARENAL CAPSULES	.....	.....	.....	.....	.....	.....	.....	1	1
Addison's disease	.....	.....	.....	.....	.....	.....	.....	1	1
DISEASES OF THE URINARY SYSTEM	16	203	58	118	5	24	14	502	781
Acute nephritis	2	22	8	12	1	3	.....	48	72
Bright's disease	1	13	.....	7	1	5	1	27	41
Chronic nephritis	7	48	.....	41	.....	9	5	42	97
Granular kidney	1	19	.....	14	1	4	1	30	50
Pyelitis	.....	4	3	1	.....	.....	.....	.....	4
Nephralgia	.....	.....	.....	.....	.....	.....	.....	3	3
Glycosuria	.....	1	.....	1	.....	.....	.....	.....	1
Abscess—									
Of kidney	.....	2	.....	1	.....	.....	1	1	3
Perinephritic	.....	3	1	.....	.....	1	1	.....	3
Congestion of kidney	.....	.....	.....	.....	.....	.....	.....	4	4
Movable kidney	.....	2	.....	2	.....	.....	.....	4	6
Calculus in kidney	1	1	1	1	.....	.....	.....	1	3
Calculus in ureter	.....	1	.....	1	.....	.....	.....	1	2
Suppression of urine	.....	1	1	.....	.....	.....	.....	2	3
Hæmaturia	.....	3	3	.....	.....	.....	.....	8	11
Albuminuria	.....	.....	.....	.....	.....	.....	.....	2	2
Lithuria	.....	.....	.....	.....	.....	.....	.....	6	6
Phosphaturia	.....	.....	.....	.....	.....	.....	.....	5	5
Rupture of bladder	.....	1	.....	.....	.....	1	.....	.....	1
Inflammation of bladder—									
Acute	4	44	28	18	.....	.....	2	198	246
Subacute	.....	3	3	.....	.....	.....	.....	42	45
Chronic	.....	23	3	15	1	1	3	73	96
Calculus of bladder	.....	1	.....	1	.....	.....	.....	10	11
Distension of bladder	.....	1	.....	.....	1	.....	.....	.....	1
Irritability of bladder	.....	1	1	.....	.....	.....	.....	23	24
Retention of urine	.....	7	6	1	.....	.....	.....	11	18
Incontinence of urine	.....	2	.....	2	.....	.....	.....	21	23
DISEASES OF THE GENERATIVE SYSTEM.	43	824	491	313	21	6	36	2,278	3,145
Urethritis	.....	1	.....	1	.....	.....	.....	44	45
Gleet	.....	3	1	2	.....	.....	.....	15	18
Abscess of the urethra	.....	1	1	.....	.....	.....	.....	.....	1
Ulcer of the urethra	.....	2	1	1	.....	.....	.....	1	3
Hæmorrhage of the urethra	.....	3	3	.....	.....	.....	.....	.....	3
Stricture of urethra—									
Organic	8	96	34	60	4	1	5	306	410
Traumatic	1	.....	1	.....	.....	.....	.....	.....	1
Spasmodic	.....	2	1	1	.....	.....	.....	3	5
Urethral fever	.....	1	1	.....	.....	.....	.....	.....	1
Urethral fistula	2	4	2	4	.....	.....	.....	3	9
Extravasation of urine	.....	2	.....	.....	.....	1	1	.....	2
Inflammation of the prostate—									
Acute	.....	5	3	2	.....	.....	.....	16	21
Chronic	.....	1	.....	1	.....	.....	.....	10	11
Prostatarrhœa	.....	1	.....	1	.....	.....	.....	4	5
Hypertrophy of the prostate	2	11	2	6	1	3	1	28	41
Posthitis	.....	2	2	.....	.....	.....	.....	5	7
Phimosis	.....	68	54	11	1	1	1	30	98
Paraphimosis	.....	13	12	1	.....	.....	.....	7	20

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE GENERATIVE SYSTEM—Continued.									
Inflammation of the penis, of the glands	.....	6	6	.....	.....	....	.....	40	46
Abscess of penis	.....	4	3	1	.....	....	.....	1	5
Ulcer of penis	11	152	74	72	4	....	13	337	500
Œdema of penis	.....	.....	.....	.....	.....	....	.....	3	3
Soft chancre	9	205	121	81	2	....	10	1,007	1,221
Priapism	.....	.....	.....	.....	.....	....	.....	2	2
Inflammation of the scrotum	.....	3	1	2	.....	....	.....	.....	3
Abscess of the scrotum	.....	5	5	.....	.....	....	.....	1	6
Pruritus of the scrotum	.....	.....	.....	.....	.....	....	.....	2	2
Inflammation of the spermatic cord	.....	2	2	.....	.....	....	.....	7	9
Hydrocele of the spermatic cord	.....	5	3	2	.....	....	.....	17	22
Abscess of prostate	1	.....	.....	1	.....	....	.....	.....	1
Varicocele	1	47	40	7	1	....	.....	104	152
Hydrocele of tunica vaginalis	.....	23	16	2	3	....	2	41	64
Inflammation of the testicle—									
Acute orchitis	5	96	62	37	1	....	1	132	233
Chronic orchitis	.....	6	3	1	2	....	.....	8	14
Epididymitis	1	39	23	14	2	....	1	49	89
Abscess of testicle	.....	2	2	.....	.....	....	.....	2	4
Spermatorrhœa	.....	3	.....	2	.....	....	1	23	26
Impotence	.....	.....	.....	.....	.....	....	.....	7	7
Œdema of the prepuce	.....	.....	.....	.....	.....	....	.....	3	3
Inflammation of the ovary	.....	.....	.....	.....	.....	....	.....	1	1
Inflammation of the uterus	.....	3	3	.....	.....	....	.....	.....	3
Displacements and distortions of the uterus	1	1	2	.....	.....	....	.....	1	3
Mastitis	.....	1	1	.....	.....	....	.....	1	2
Inflammation of the vagina	.....	.....	.....	.....	.....	....	.....	3	3
Torsion of the spermatic cord	.....	1	1	.....	.....	....	.....	.....	1
Dysmenorrhœa	.....	.....	.....	.....	.....	....	.....	2	2
Menorrhagia	.....	.....	.....	.....	.....	....	.....	2	2
Leucorrhœa	.....	.....	.....	.....	.....	....	.....	5	5
Abscess of areola	.....	1	1	.....	.....	....	.....	.....	1
Hæmatoma of scrotum	1	2	3	.....	.....	....	.....	.....	3
Inflammation of vesicular seminales	.....	.....	.....	.....	.....	....	.....	2	2
Lacerated perineum	.....	.....	.....	.....	.....	....	.....	1	1
Adhesions following ovariotomy	.....	.....	.....	.....	.....	....	.....	1	1
Atrophy of testicle	.....	1	1	.....	.....	....	.....	.....	1
DISEASES OF THE ORGANS OF LOCOMOTION	23	284	164	99	9	4	31	1,348	1,655
Inflammation of the bones—									
Osteitis	1	4	3	1	.....	....	1	5	10
Periostitis	2	14	6	7	.....	....	3	14	30
Caries	1	10	4	3	2	....	2	1	12
Necrosis	4	24	16	8	.....	1	3	17	45
Ununited fracture or false joint	.....	2	.....	.....	.....	....	2	.....	2
Inflammation of joints—									
Acute synovitis	2	29	21	10	.....	....	.....	59	90
Chronic synovitis	1	8	1	4	1	....	3	2	11
Suppuration	1	3	.....	3	.....	....	1	1	5
Ankylosis	2	9	.....	6	1	....	4	5	16
Dislocation of articular cartilage	.....	3	.....	3	.....	....	.....	7	10
Loose body in joint	.....	.....	.....	.....	.....	....	.....	1	1
Relaxation of ligaments	.....	.....	.....	.....	.....	....	.....	1	1
Dislocation of hip	1	.....	.....	1	.....	....	.....	.....	1
Caries of the spine	1	1	.....	.....	.....	1	1	.....	2
Psoas, lumbar, and other abscesses	.....	2	2	.....	.....	....	.....	.....	2
Posterior curvature of spine, angular	.....	1	.....	.....	.....	....	1	.....	1
Anterior curvature of spine	1	1	.....	1	.....	....	1	.....	2
Suppuration of muscles	.....	3	3	.....	.....	....	.....	2	5
Myalgia	6	120	88	27	4	2	5	1,131	1,257
Inflammation of fasciæ	.....	.....	.....	.....	.....	....	.....	4	4
Contracture of fasciæ	.....	.....	.....	.....	.....	....	.....	1	1
Inflammation of tendons	.....	.....	.....	.....	.....	....	.....	6	6
Contraction of tendons	.....	1	1	.....	.....	....	.....	2	3
Displacement of tendons	.....	.....	.....	.....	.....	....	.....	2	2

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE ORGANS OF LOCOMOTION—Continued.									
Inflammation of sheaths of tendons	.....	1	1	.....	.....	.....	.....	10	11
Thecal abscess	.....	3	1	2	.....	.....	.....	5	8
Ganglion	.....	.....	.....	.....	.....	.....	.....	3	3
Inflammation of bursæ—									
Acute	.....	14	4	7	.....	.....	3	20	34
Chronic	.....	2	.....	2	.....	.....	.....	4	6
Abscess of bursæ	.....	4	2	2	.....	.....	.....	2	6
Bunion	.....	5	1	3	.....	.....	1	8	13
Bursal cyst	.....	2	1	.....	1	.....	.....	6	8
Flat foot	.....	7	3	4	.....	.....	.....	13	20
Clubfoot	.....	1	.....	1	.....	.....	.....	.....	1
DISEASES OF THE CONNECTIVE TISSUE.	9	311	209	94	1	3	13	603	923
Inflammation	3	105	74	27	.....	1	6	108	216
Abscess	5	202	134	64	1	2	6	473	680
Gangrene	.....	.....	.....	.....	.....	.....	.....	1	1
Œdema	.....	5	2	2	.....	.....	1	19	24
Undue formation of fat	.....	.....	.....	.....	.....	.....	.....	2	2
DISEASES OF THE SKIN	28	390	238	148	4	2	26	2,311	2,729
Erythema	.....	6	5	1	.....	.....	.....	12	18
Roseola	.....	1	1	.....	.....	.....	.....	.....	1
Urticaria	1	4	4	.....	.....	.....	1	77	82
Prickly heat	.....	2	2	.....	.....	.....	.....	27	29
Eczema	5	31	18	14	1	.....	3	464	500
Impetigo	1	11	7	4	.....	.....	1	54	66
Pityriasis rubra	.....	2	.....	2	.....	.....	.....	3	5
Prurigro	.....	.....	.....	.....	.....	.....	.....	6	6
Lichen	.....	.....	.....	.....	.....	.....	.....	11	11
Psoriasis	.....	9	2	6	.....	.....	1	44	53
Herpes	.....	2	2	.....	.....	.....	.....	86	88
Zona	.....	8	6	2	.....	.....	.....	33	41
Pemphigus	.....	3	1	2	.....	.....	.....	11	14
Dermatitis herpetiformis	.....	2	1	1	.....	.....	.....	9	11
Acne	.....	1	1	.....	.....	.....	.....	72	73
Gutta rosea	.....	.....	.....	.....	.....	.....	.....	1	1
Sycosis	.....	2	1	1	.....	.....	.....	45	47
Seborrhœa	.....	.....	.....	.....	.....	.....	.....	4	4
Ichthyosis	.....	.....	.....	.....	.....	.....	.....	5	5
Sudamina	.....	.....	.....	.....	.....	.....	.....	2	2
Chloasma	.....	.....	.....	.....	.....	.....	.....	2	2
Area	.....	.....	.....	.....	.....	.....	.....	1	1
Alopecia	.....	.....	.....	.....	.....	.....	.....	1	1
Chilblain	.....	1	1	.....	.....	.....	.....	2	3
Ulcer	17	183	103	77	1	2	17	563	763
Cicatrices	.....	2	1	1	.....	.....	.....	.....	2
Boil	1	55	37	17	.....	.....	2	543	599
Carbuncle	.....	32	25	6	1	.....	.....	54	86
Whitlow	3	12	10	5	.....	.....	.....	55	70
Onychia	.....	5	5	.....	.....	.....	.....	38	43
Corn	.....	1	1	.....	.....	.....	.....	17	18
Tylosis	.....	3	.....	3	.....	.....	.....	7	10
Cheloid	.....	1	.....	1	.....	.....	.....	2	3
Wen	.....	3	2	1	.....	.....	.....	10	13
Hyperidrosis	.....	.....	.....	.....	.....	.....	.....	3	3
Pruritus	.....	.....	.....	.....	.....	.....	.....	25	25
Lupus	.....	2	1	1	.....	.....	.....	.....	2
Gangrene	.....	2	.....	1	.....	.....	1	.....	2
Milium	.....	.....	.....	.....	.....	.....	.....	2	2
Mycosis fungoides	.....	2	.....	1	1	.....	.....	1	3
Molluscum contagiosum	.....	1	.....	1	.....	.....	.....	.....	1
Bromidrosis	.....	.....	.....	.....	.....	.....	.....	1	1
Rhinoscleroma	.....	1	1	.....	.....	.....	.....	26	27
Injuries	**140**	**2,332**	**1,601**	**677**	**31**	**45**	**118**	**4,020**	**6,492**
GENERAL INJURIES	4	132	93	25	1	9	8	201	337
Effects of heat—									
Burns and scalds	3	64	44	16	.....	4	3	154	221
Heat stroke	.....	27	25	1	.....	1	.....	10	37

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
GENERAL INJURIES—Continued.									
Effects of cold	.....	1	1	.....	.....	.....	.....	5	6
Effects of chemical irritants and corrosives	.....	5	3	2	.....	.....	.....	10	15
Multiple injury	.....	27	14	5	1	3	4	15	42
Privation, starvation	.....	1	1	.....	.....	.....	.....	.....	1
Exhaustion	1	5	5	1	.....	.....	.....	7	13
Shock	.....	2	.....	.....	.....	1	1	.....	2
LOCAL INJURIES	136	2,200	1,508	652	30	36	110	4,819	7,155
Contusion of nerves	.....	1	1	.....	.....	.....	.....	1	2
Compression of nerve	.....	.....	.....	.....	.....	.....	.....	1	1
Wound of nerve	.....	.....	.....	.....	.....	.....	.....	3	3
Rupture of veins	.....	2	1	.....	.....	1	.....	.....	2
Contusion of lymph glands	.....	1	.....	1	.....	.....	.....	1	2
Contusion of muscles	.....	8	6	2	.....	.....	.....	19	27
Strain of muscles	1	13	11	3	.....	.....	.....	65	79
Rupture of muscles	.....	.....	.....	.....	.....	.....	.....	1	1
Wounds of muscles	.....	1	1	.....	.....	.....	.....	3	4
Rupture of tendons	1	.....	.....	1	.....	.....	.....	.....	1
Contusion of skin	.....	7	5	2	.....	.....	.....	10	17
Abrasion of skin	.....	4	3	1	.....	.....	.....	72	76
Wound of skin	.....	4	3	1	.....	.....	.....	12	16
Burn or scald of skin	10	84	63	24	1	2	4	174	268
Frostbite	1	19	16	3	.....	.....	1	16	36
Effects on the skin of irritants or corrosives	.....	2	1	1	.....	.....	.....	11	13
Abrasion of mucous membrane	.....	1	.....	1	.....	.....	.....	5	6
Wound of mucous membrane	.....	.....	.....	.....	.....	.....	.....	1	1
Burn or scald of mucous membrane	.....	2	1	.....	.....	.....	1	5	7
Contusion of scalp	.....	13	12	1	.....	.....	.....	12	25
Wound of scalp	1	58	42	13	.....	.....	4	166	225
With injury to the aponeurosis	.....	3	1	2	.....	.....	.....	2	5
With injury to the bone	.....	1	1	.....	.....	.....	.....	.....	1
Contusion of skull	.....	3	1	1	.....	1	.....	8	11
Fracture of the vault of skull	1	15	9	1	.....	5	1	1	17
Fracture of the base of skull	.....	8	4	1	.....	3	.....	1	9
Wound of skull	1	4	2	2	.....	1	.....	2	7
Concussion of brain	4	13	8	5	1	2	1	1	18
Contusion of face	.....	25	16	8	.....	.....	1	40	65
Wound of face and mouth	1	62	46	13	3	1	.....	170	233
Fracture of facial bones	1	28	15	10	.....	2	2	16	45
Dislocation of nasal cartilages	.....	1	1	.....	.....	.....	.....	.....	1
Injury to alveoli and teeth	.....	.....	.....	.....	.....	.....	.....	3	3
Contusion of eyelid	.....	2	1	1	.....	.....	.....	10	12
Wound of eyelid	1	4	4	1	.....	.....	.....	13	18
Injury to lachrymal gland	.....	.....	.....	.....	.....	.....	.....	2	2
Chemical injury to eye	1	.....	.....	1	.....	.....	.....	.....	1
Subconjunctival hemorrhage	.....	1	1	.....	.....	.....	.....	1	2
Wound of conjunctiva	.....	.....	.....	.....	.....	.....	.....	4	4
Contusion of eyeball	.....	5	3	2	.....	.....	.....	3	8
Foreign bodies in the conjunctiva or cornea	.....	5	4	1	.....	.....	.....	98	103
Foreign body in the eyeball	.....	2	1	.....	.....	.....	1	2	4
Wound of eyeball	.....	8	3	4	1	.....	.....	5	13
Wound of super-orbital region	.....	1	1	.....	.....	.....	.....	2	3
Contusion of pinna	.....	.....	.....	.....	.....	.....	.....	4	4
Wound of pinna	.....	2	1	1	.....	.....	.....	10	12
Rupture of membrana tympani	.....	1	.....	.....	1	.....	.....	.....	1
Fracture of spine with displacement	.....	1	1	.....	.....	.....	.....	.....	1
Foreign body in external meatus	.....	.....	.....	.....	.....	.....	.....	6	6
Compression of spinal cord	1	1	.....	1	.....	1	.....	.....	2
Fracture of spine	.....	4	1	2	.....	.....	1	.....	4
Dislocation of spine	1	2	.....	.....	.....	2	1	.....	3
Gunshot wound	.....	9	3	3	1	1	1	2	11
Contusion of heart and lung	.....	3	2	1	.....	.....	.....	.....	3
Contusion of neck	.....	3	1	2	.....	.....	.....	7	10
Wound of neck	.....	3	2	.....	.....	.....	1	9	12
Foreign body in the air passages	.....	.....	.....	.....	.....	.....	.....	1	1
Foreign body in the food passages	.....	.....	.....	.....	.....	.....	.....	1	1

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
LOCAL INJURIES—Continued.									
Compression of chest	.....	1	1	.....	.....	....	.....	1	2
Contusion of chest	1	59	37	19	1	....	3	148	208
Dislocation of costal cartilages	.....	1	.....	1	.....	....	.....	2	3
Fracture of ribs	4	82	53	26	3	2	2	64	150
Wound of parietes of chest	.....	2	1	1	.....	....	.....	6	8
Penetrating wound of pleura or lung	.....	2	1	1	.....	....	.....	.....	2
Contusion of back	5	83	67	17	.....	....	4	135	223
Sprain of back	2	39	31	10	.....	....	.....	120	161
Wound of back	.....	11	6	5	.....	....	.....	8	19
Fracture of spine	.....	5	1	1	1	2	.....	.....	5
Concussion of cord	.....	1	1	.....	.....	....	.....	.....	1
Contusion of abdomen	.....	13	7	4	.....	2	.....	15	28
Wound of parietes of abdomen	.....	9	6	2	.....	1	.....	15	24
Contusion of the pelvis	.....	1	1	.....	.....	....	.....	4	5
Contusion of the perinæum, scrotum, or penis	.....	1	.....	.....	.....	....	1	.....	1
Wound of the male urethra, perineum, scrotum, testis, or penis	1	3	1	3	.....	....	.....	10	14
Wound of anus	.....	.....	.....	.....	.....	....	.....	1	1
Rupture of urethra	.....	4	3	1	.....	....	.....	.....	4
Foreign body in the rectum	.....	.....	.....	.....	.....	....	.....	1	1
Fracture or dislocation of pelvic bones	.....	6	4	1	.....	....	1	.....	6
Rupture of liver	1	2	2	.....	.....	....	1	.....	3
Foreign body in alimentary canal	.....	.....	.....	.....	.....	....	.....	1	1
Contusion of testicle	.....	2	1	1	.....	....	.....	7	9
Contusion of upper extremities	2	89	52	30	4	....	5	370	461
Sprain of shoulder	.....	11	8	3	.....	....	.....	51	62
Sprain of elbow	.....	10	5	4	.....	....	1	14	24
Sprain of wrist	1	25	15	9	.....	....	2	158	184
Sprain of hand	.....	3	1	2	.....	....	.....	14	17
Sprain of thumb	.....	.....	.....	.....	.....	....	.....	19	19
Sprain of fingers	.....	1	.....	1	.....	....	.....	14	15
Wound of upper extremities	9	241	157	79	3	1	10	1,456	1,706
Wound of joint, upper extremities	.....	1	.....	1	.....	....	.....	10	11
Fracture of clavicle	2	24	13	9	1	....	3	8	34
Fracture of scapula	1	6	6	1	.....	....	.....	1	8
Fracture of humerus	4	17	10	9	.....	1	1	7	28
Fracture of bones of forearm—									
Radius	5	31	18	15	2	1	.....	18	54
Ulna	2	15	10	7	.....	....	.....	11	28
Both bones	4	14	14	3	.....	1	.....	8	26
Fracture of carpus, metacarpus, or phalanges	.....	40	24	12	.....	2	2	48	88
Dislocation of clavicle	.....	2	2	.....	.....	....	.....	.....	2
Dislocation of scapula	.....	1	1	.....	.....	....	.....	.....	1
Dislocation of humerus	2	31	22	9	.....	....	2	18	51
Dislocation of radius and ulna	.....	6	4	2	.....	....	.....	5	11
Dislocation of phalanges of thumb	.....	.....	.....	.....	.....	....	.....	4	4
Dislocation of phalanges of fingers	.....	.....	.....	.....	.....	....	.....	7	7
Dislocation of metacarpus	.....	1	.....	.....	1	....	.....	1	2
Fracture of olecranon	.....	1	.....	1	.....	....	.....	.....	1
Injury to bursæ	.....	.....	.....	.....	.....	....	.....	3	3
Contusion of lower extremities	11	259	205	58	.....	2	5	356	626
Sprain of hip	1	2	.....	3	.....	....	.....	4	7
Sprain of knee	3	24	13	13	.....	....	1	46	73
Sprain of ankle	3	176	123	55	.....	....	1	181	360
Sprain of foot	.....	5	5	.....	.....	....	.....	13	18
Internal derangement of joints	.....	.....	.....	.....	.....	....	.....	1	1
Wound of lower extremities	9	224	160	55	3	4	11	368	601
Wound of joint, lower extremities	.....	6	5	.....	.....	....	1	6	12
Fracture of femur	6	20	9	7	1	3	6	4	30
Fracture of patella	2	7	7	2	.....	....	.....	1	10
Fracture of tibia	3	35	24	11	.....	....	3	10	48
Fracture of fibula	4	30	22	8	2	1	1	4	38
Fracture of tibia and fibula	18	34	27	11	2	7	5	1	53
Fracture of bones of foot—									
Of the tarsus	2	3	3	2	.....	....	.....	3	8
Of the metatarsus	.....	9	6	3	.....	....	.....	3	12
Of the phalanges of the toes	.....	11	6	5	.....	....	.....	2	13

TABLE VII.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1906—Continued.

Disease.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
LOCAL INJURIES—Continued.									
Dislocation of femur	1	3	3	.....	.....	.....	1	1	5
Dislocation of patella	.....	3	1	2	.....	.....	.....	.....	3
Dislocation of tibia	.....	1	1	.....	.....	.....	.....	.....	1
Dislocation of fibula	.....	1	1	.....	.....	.....	.....	.....	1
Dislocation of foot	.....	1	.....	1	.....	.....	.....	.....	1
Dislocation of metatarsus and phalanges	.....	1	.....	.....	.....	1	.....	2	3
Fracture of oscalcis	1	4	4	1	.....	.....	.....	.....	5
Fracture of astragalus	.....	1	.....	.....	.....	.....	1	.....	1
Green stick fracture	.....	.....	.....	.....	.....	.....	.....	1	1
Malingerer	.....	2	1	.....	1	.....	.....	7	9
Undetermined	.....	2	2	.....	.....	.....	.....	2	4

TABLE VIII.—TABULATED STATEMENT, BY DISTRICTS, OF CAUSES OF MORTALITY AMONG PATIENTS OF THE SERVICE DURING THE YEAR ENDED JUNE 30, 1906.

Cause of death.	Total.	Districts.								
		Atlantic.	West Indies.	Gulf.	Ohio.	Mississippi.	Great Lakes.	Pacific.	Pacific Islands.	Quarantine stations.
Total deaths from all causes	**493**	**147**	**0**	**49**	**13**	**40**	**89**	**147**	**5**	**3**
FROM INJURIES	45	6	0	4	1	7	18	9	0	0
FROM DISEASES	448	141	0	45	12	33	71	138	5	3
General diseases	**254**	**73**	.....	**23**	**5**	**15**	**38**	**96**	**1**	**3**
Plague	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Typhus fever	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Influenza	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Cerebrospinal fever	5	5	.....	.....	.....	.....	.....	.....	.....	.....
Enteric fever	41	11	.....	3	3	1	15	8	.....	.....
Dysentery	3	1	.....	.....	1	1	.....	.....	.....	.....
Yellow fever	5	.....	.....	5	.....	.....	.....	.....	.....	.....
Malarial fever:										
Intermittent	3	1	.....	.....	.....	.....	.....	2	.....	.....
Remittent	3	.....	.....	2	.....	.....	.....	.....	.....	1
Hospital gangrene	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Erysipelas	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Pyæmia	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Septicæmia	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Tetanus	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Tubercle	140	35	.....	9	1	8	10	76	1	.....
Syphilis, secondary	4	.....	.....	.....	.....	1	1	2	.....	.....
Alcoholism	11	7	.....	.....	.....	1	1	2	.....	.....
Rheumatic fever	3	1	.....	1	.....	.....	1	.....	.....	.....
Rheumatism	4	3	.....	.....	.....	.....	1	.....	.....	.....
New growth, malignant	12	2	.....	1	.....	.....	6	3	.....	.....
Leuchæmia	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Anæmia	2	1	.....	.....	.....	.....	1	.....	.....	.....
Hodgkin's disease	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Diabetes mellitus	2	1	.....	.....	.....	.....	.....	1	.....	.....
Debility	4	2	.....	.....	.....	2	.....	.....	.....	.....
Old age	2	.....	.....	2	.....	.....	.....	.....	.....	.....

'ABLE VIII.—TABULATED STATEMENT, BY DISTRICTS, OF CAUSES OF MORTALITY AMONG PATIENTS OF THE SERVICE DURING THE YEAR ENDED JUNE 30, 1906—Con.

Cause of death.	Total.	Districts.								
		Atlantic.	West Indies.	Gulf.	Ohio.	Mississippi.	Great Lakes.	Pacific.	Pacific Islands.	Quarantine stations.
Local Diseases	**194**	**68**	.....	**22**	**7**	**18**	**33**	**42**	**4**	.....
DISEASES OF THE NERVOUS SYSTEM	24	12	.....	4	.....	2	2	4	.....	.....
Of the nerves—										
Inflammation of dura mater	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Of the spinal cord and membranes—cord—										
Inflammation, diffuse	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Degeneration of posterior columns	4	1	.....	.....	.....	1	.....	2	.....	.....
Of the brain and its membranes—membranes—										
Inflammation of dura mater	2	.....	.....	1	.....	.....	.....	1	.....	.....
Of the brain and its membranes—brain—										
Inflammation	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Hæmorrhage	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Hyperæmia	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Functional nervous disorders with other diseases of undetermined nature—										
Apoplexy	2	.....	.....	.....	.....	.....	2	.....	.....	.....
Hemiplegia	3	3	.....	.....	.....	.....	.....	.....	.....	.....
Eclampsia uræmic	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Vertigo	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Mental diseases—										
Mania	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Dementia	5	5	.....	.....	.....	.....	.....	.....	.....	.....
DISEASES OF THE EAR	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Inflammation of the middle ear—										
Suppurative	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Within the mastoid cells	1	1	.....	.....	.....	.....	.....	.....	.....	.....
DISEASES OF THE CIRCULATORY SYSTEM	55	16	.....	8	2	2	10	16	1	.....
Endocarditis	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Valvular disease—										
Aortic	6	1	.....	2	.....	.....	1	2	.....	.....
Mitral	26	3	.....	2	1	2	4	13	1	.....
Aortic and mitral	11	9	.....	2	.....	.....	.....	.....	.....	.....
Tricuspid	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Dilatation of heart	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Arteritis	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Degeneration of arteries, arterio-capillary fibrosis	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Aneurism of arteries	3	.....	.....	1	1	.....	1	.....	.....	.....
Obstruction of arteries, embolism	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Traumatic aneurism	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Rupture of artery	2	.....	.....	.....	.....	.....	2	.....	.....	.....
DISEASES OF THE RESPIRATORY SYSTEM	45	15	.....	4	2	8	6	10	.....	.....
Bronchitis	3	3	.....	.....	.....	.....	.....	.....	.....	.....
Spasmodic asthma	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Congestion of lung	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Pneumonia	27	6	.....	3	2	7	4	5	.....	.....
Broncho-pneumonia	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Œdema of lungs	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Abscess of lung	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Phthisis—										
Chronic	3	.....	.....	.....	.....	.....	1	2	.....	.....
Tubercular	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Pleurisy—										
Acute	3	2	.....	.....	.....	.....	.....	1	.....	.....
Chronic	2	1	.....	.....	.....	.....	.....	1	.....	.....
Empyema	1	1	.....	.....	.....	.....	.....	.....	.....	.....
DISEASES OF THE DIGESTIVE SYSTEM	29	9	.....	4	.....	2	9	5	.....	.....
Ulceration of the mouth	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Caries of dentine and cementum	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Sore throat	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Inflammation of tonsils, suppuration	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Stricture of œsophagus	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Inflammation of stomach—										
Chronic	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Acute	3	.....	.....	2	.....	.....	.....	1	.....	.....
Ulceration of the stomach, superficial	1	.....	.....	.....	.....	.....	.....	1	.....	.....

TABLE VIII.—TABULATED STATEMENT, BY DISTRICTS, OF CAUSES OF MORTALITY AMONG PATIENTS OF THE SERVICE DURING THE YEAR ENDED JUNE 30, 1906—Con.

Cause of death.	Total.	Districts.								
		Atlantic.	West Indies.	Gulf.	Ohio.	Mississippi.	Great Lakes.	Pacific.	Pacific Islands.	Quarantine stations.
DISEASES OF THE DIGESTIVE SYSTEM—Con.										
Inflammation of the intestines—										
Enteritis	1						1			
Typhlitis	4	3					1			
Volvulus	1	1								
Hernia	3					1	1	1		
Diarrhœa	1	1								
Perforation of appendix	1						1			
Piles, mixed	1						1			
Inflammation of the liver—										
Acute	1	1								
Chronic	3			1			2			
Inflammation of the peritonæum	2					1		1		
Acute yellow atrophy liver	1						1			
DISEASES OF THE URINARY SYSTEM	24	7		2	2	2	4	5	2	
Acute nephritis	3	1			1		1			
Bright's disease	5				1	1		3		
Chronic nephritis	9	3		1		1	3	1		
Granular kidney	4	2						1	1	
Abscess, perinephritic	1			1						
Inflammation of bladder, chronic	1								1	
Rupture of bladder	1	1								
DISEASES OF THE GENERATIVE SYSTEM	6	3				2	1			
Stricture of urethra, organic	1					1				
Extravasation of urine	1	1								
Hypertrophy of the prostate	3	2					1			
Phimosis	1					1				
DISEASES OF THE ORGANS OF LOCOMOTION	4	2			1		1			
Necrosis	1						1			
Caries of the spine	1	1								
Myalgia	2	1			1					
DISEASES OF THE CONNECTIVE TISSUE	3	2							1	
Inflammation	1	1								
Abscess	2	1							1	
DISEASES OF THE SKIN	2							2		
Ulcer	2							2		
Injuries	**45**	**6**		**4**	**1**	**7**	**18**	**9**		
GENERAL INJURIES	9			2		3	4			
Effects of heat—										
Burns and scalds	4			2			2			
Heat stroke	1					1				
Multiple injury	3					1	2			
Shock	1					1				
LOCAL INJURIES	36	6		2	1	4	14	9		
Rupture	1					1				
Burn or scald of skin	2	1		1						
Contusion of skull	1							1		
Fracture of the vault of skull	5	1				1	2	1		
Fracture of the base of skull	3						2	1		
Wound of skull	1						1			
Concussion of brain	2						2			
Wound of face and mouth	1						1			
Fracture of facial bones	2	1					1			
Gunshot wound	1					1				
Fracture of ribs	2							2		
Fracture of spine	2							2		
Contusion of abdomen	2						1	1		
Wound of parietes of abdomen	1			1						
Dislocation of spine	2	1						1		
Compression of spinal cord	1						1			
Wound of upper extremities	1					1				
Contusion of lower extremities	1				1					
Wound of lower extremities	1	1								
Fracture of femur	1						1			
Fracture of tibia and fibula	2	1					1			
Dislocation of metatarsus and phalanges	1						1			

TABLE IX.—RATIO OF DEATHS FROM SPECIFIC CAUSES.

Deaths from—	Per 100 from all causes.	Deaths from—	Per 100 from all causes.
General diseases	51.52	Diseases of the digestive system	5.88
Diseases of the nervous system	4.87	Diseases of the genito-urinary system	6.09
Diseases of the circulatory system	11.16	Injuries	9.13
Diseases of the respiratory system	9.13	All other diseases	2.22

TABLE X.—RATIO OF DEATHS IN EACH DISTRICT.

District.	Per 100 patients treated in hospital.	District.	Per 100 patients treated, in hospital.
Atlantic	3.08	Great Lakes	3.07
West Indies	0	Pacific	5.65
Gulf	3.70	Pacific islands	2.11
Ohio	1 52	Quarantine stations	3.61
Mississippi	3.99		

TABLE XI.—COMPARATIVE EXHIBIT—MORTALITY PER 100 PATIENTS TREATED IN HOSPITAL, BY DISTRICTS, 1897–1906.

District.	General average.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
Atlantic	3.33	3.17	3.32	3.36	3.42	3.23	3.10	4.13	3.18	3.34	3.08
West Indies	1.35	.....	.....	.....	.....	.....	.....	.....	3.07	.97	0
Gulf	3.30	3.33	2.94	2.78	4.11	2.87	3.59	3.78	2.96	2.95	3.70
Ohio	2.80	2.78	2.73	3.28	3.58	2.18	2.16	2.86	3.76	3.13	1.52
Mississippi	3.21	2.92	3.18	3.13	3.46	3.46	2.38	2.97	2.67	3.91	3.99
Great Lakes	2.83	2.86	2.34	3.26	2.42	2.91	2.34	3.84	2.63	2.59	3.07
Pacific	4.53	4.40	3.43	4.87	3.78	3.62	3.93	4.90	5.29	5.45	5.65
Pacific islands	3.79	.....	.....	.....	.....	.....	.....	8.57	2.28	2.21	2.11
Quarantine stations	6.30	4.94	2.68	1.15	12.90	6.38	6.06	12.12	6.77	6.45	3.61

TABLE XII.—COMPARATIVE EXHIBIT—RATIO OF DEATHS FROM SPECIFIC CAUSES, 1897–1906.

Deaths from—	General average.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
General diseases	48.62	48.99	45.45	55.60	44.02	45.60	44.01	48.06	49.49	53.46	51.52
Diseases of the—											
Nervous system	5.67	5.56	6.56	3.02	3.62	8.78	7.29	5.36	5.30	6.32	4.87
Circulatory system	10.81	9.85	12.86	9.07	9.71	11.87	12.23	10.72	8.76	11.88	11.16
Respiratory system	11.74	10.35	11.29	9.30	15.12	13.53	13.54	11.64	14.06	8.81	9.13
Digestive system	7.34	9.09	7.35	7.67	9.70	6.65	7.55	7.39	7.33	4.79	5.88
Genito-urinary system	6.55	7.07	5.25	8.37	9.03	5.70	4.94	6.65	6.72	5.74	6.09
Injuries	6.72	6.31	8.66	5.35	6.32	5.22	7.55	6.47	5.09	7.09	9.13
From all other causes	2.55	2.78	2.63	1.62	2.48	2.61	2.86	3.71	2.65	1.91	2.22

TABLE XIII.—COMPARATIVE EXHIBIT—AVERAGE DURATION OF TREATMENT IN HOSPITAL IN EACH DISTRICT, 1897–1906.

District.	General average.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
Atlantic	28.82	28.93	30.74	32.00	27.88	28.82	29.35	28.36	27.48	27.43	27.17
West Indies	22.10	.....	.....	.....	.....	.....	.....	20.47	23.90	22.94	21.11
Gulf	23.75	22.41	21.35	21.41	23.15	22.78	25.65	27.14	27.52	22.89	23.27
Ohio	21.86	22.20	23.83	23.02	21.98	20.88	20.81	21.53	21.48	22.67	20.21
Mississippi	16.93	19.00	18.57	17.56	15.47	15.42	18.41	15.30	16.62	16.26	16.73
Great Lakes	20.73	26.27	25.45	24.02	20.24	21.20	21.15	21.90	23.61	23.19	23.70
Pacific	40.81	36.20	28.41	29.12	31.15	38.17	42.34	48.16	50.81	51.27	52.47
Pacific islands	27.57	.....	.....	.....	.....	.....	.....	26.15	26.10	31.48	26.55
Quarantine stations	14.42	11.69	9.00	10.43	13.72	21.21	18.48	20.42	10.28	13.19	15.80

TABLE XIV.—SURGICAL OPERATIONS, FISCAL YEAR 1906.

Operations.	No. of cases.	Remarks.
Total number of operations	**1,648**	
OPERATIONS ON TUMORS:		
Removal by excision	39	
For lipoma	14	
For fibroma	5	
For sarcoma	4	
For carcinoma	3	
For condyloma	3	
For epithelioma	6	
For hematoma	2	
For myxoma	2	
OPERATIONS ON CYSTS	32	
Sebaceous cyst	25	
Bursal cyst	5	
Serous cyst of neck	2	
EVACUATION OF ABSCESSES:		
By free incision and drainage	147	
Abscess of—		
Arm	21	
Axilla	2	
Back	4	
Breast	2	
Face	1	
Foot	5	
Finger	13	
Hand	16	
Ischio rectal fossa	26	
Knee	5	
Leg	14	
Lower jaw	5	
Neck	9	
Perineum	7	
Thigh	7	
Psoas muscle	1	
Scrotum	2	
Head	3	
Testis	2	
Perinephritic	2	
OPERATIONS FOR REMOVAL OF FOREIGN BODIES	21	
From—		
Eye	14	
Leg	2	
Finger	3	
Hand	1	
Spinal column	1	

TABLE XIV.—SURGICAL OPERATIONS, FISCAL YEAR 1906—Continued.

Operations.	No. of cases.	Remarks.
OPERATIONS ON BLOOD VESSELS	48	
Operations on arteries	6	
Ligation for hemorrhage	3	
For aneurism	3	1 femoral; 1 popliteal; 1 brachial.
Operations on veins	42	
Obliteration of varices leg	41	35 ligation and excision; 4 ligation only; 2 Schede's.
Rupture femoral vein	1	
OPERATIONS ON NERVES	7	
Stretching of a nerve	4	
Union of divided nerve	2	
Resection of nerve	1	
OPERATION ON THE LYMPHATIC ORGANS	263	
Incision and drainage of inflamed and suppurating glands	77	
Groin	71	
Neck	4	
Axilla	2	
Removal of lymphatic glands	186	
Groin	171	
Neck	13	
Axilla	2	
OPERATIONS ON THE SKIN AND SUBCUTANEOUS TISSUE	123	
For chronic ulcer of leg	58	
Wound of—		
Scalp	16	
Face	9	
Arm	8	
Hand	15	
Leg	2	
Foot	2	
Perineum	1	
Neck	1	
Scrotum	1	
Skin graft for—		
Burn	3	
Ulcer	6	
Denuded surface	1	
OPERATIONS ON BONES	77	
Excision of portion of bone	29	
Of tibia	3	For necrosis.
Of femur	4	Do.
Of ribs	2	Do.
Of metatarsal	6	For necrosis, 1; for bunion, 5.
Of clavicle	2	
Of humerus	3	
Of ulna	2	
Of inferior maxilla	2	
Of metacarpal	3	
Of frontal	1	
Of phalanx	1	
Removal of fragments of bones by curetting and scraping	11	
Of sternum	2	For necrosis.
Of inferior maxilla	1	Do.
Of tarsus	2	Do.
Of tibia	2	Do.
Of superior maxilla	1	Do.
Of femur	3	Do.
Operations for ununited fractures	9	
Of tibia and fibula	3	Wired.
Of femur	2	
Of radius	1	
Of humerus	1	

TABLE XIV.—SURGICAL OPERATIONS, FISCAL YEAR 1906—Continued.

Operations.	No. of cases.	Remarks.
OPERATIONS ON BONES—Continued.		
Operations for ununited fractures—Continued.		
Of metacarpal	1	
Of ulna	1	
Operations on fractured bones for fracture of	28	
Inferior maxilla	4	Bones wired, or fragments removed.
Humerus	3	
Radius and ulna	2	
Patella	3	
Radius	1	
Femur	2	
Tibia and fibula	3	
Tibia	9	
Olecranon process	1	
OPERATIONS ON JOINTS	33	
Reduction of dislocation	18	
Shoulder	13	
Elbow	1	
Hip	2	
Inferior maxilla	2	
Operations for anchylosis of joints	9	
Shoulder	4	
Knee	2	
Hammer-toe	3	
Aspiration	3	
Elbow	1	
Knee	2	
Excision of cartilage of knee	1	
Excision of joints	2	
Knee	1	
Elbow	1	
OPERATIONS ON MUSCLES, TENDONS, AND FASCIA	7	
Tenotomy	2	
Tenotomy ocular	2	
Suture of tendon	3	
AMPUTATIONS	83	
Of thigh	2	
Of leg	12	
Of arm	2	
Of finger	43	
Of toe	20	
Of foot	4	
OPERATIONS ON THE SKULL	14	
Trephining and removal of portions of bone	10	
Opening of mastoid cells	4	
OPERATIONS ON THE SPINE AND SPINAL CORD	1	
Excision of neural arches	1	
OPERATIONS ON FACE, NASAL CAVITIES, AND MOUTH	10	
For deformity of nose	1	
Removal of polypi	1	
For deviation of nasal septum	1	
Removal of tonsils	4	
Plastic operation, nose	2	
Harelip	1	
OPERATIONS ON THE EYE AND ITS APPENDAGES	17	
Extraction of lens	4	
Excision of eyeball	5	
Removal of pterygium	7	
Plastic operation on eyelid	1	

TABLE XIV.—SURGICAL OPERATIONS, FISCAL YEAR 1906—Continued.

Operations.	No. of cases.	Remarks.
OPERATIONS ON THE THORAX AND BREAST	56	
Paracentesis of the pleural cavity	52	
Thoracotomy with excision of part of rib	2	
Thoracotomy, simple incision	1	
Schede's operation	1	
OPERATIONS OF THE ABDOMEN	228	
Abdominal section	80	
Appendicitis	58	57 recovered; 1 died
Peritonitis	2	
Exploration	4	
Gastro-enterostomy	4	
Suture of intestines	1	
Enterectomy	2	
Cholecystotomy	4	
Nephrotomy	2	
Volvulus	1	
Gastrostomy	2	
Operations for hernia	148	
For radical cure—		
(1) Oblique inguinal	144	121 Bassini; 20 Ferguson; 3 Halstead
(2) Ventral	2	
(3) Femoral	2	
OPERATIONS ON THE RECTUM AND ANUS	101	
For fistula in ano	48	
For anal fissure	4	
For hemorrhoids	49	
By clamp and cautery	21	
By ligation and excision	25	
Ulcer of rectum	1	
Stricture of rectum	1	
Prolapse of rectum	1	
OPERATIONS ON THE BLADDER AND URETHRA	113	
Upon bladder	5	
Median perineal cystotomy	3	
Suprapubic cystotomy	1	
Rupture of bladder	1	
For stricture of urethra	107	
(1) By gradual dilatation	70	
(2) By forcible dilatation	2	
(3) By internal urethrotomy	21	
(4) By external urethrotomy	14	
Fistula of urethra	1	
OPERATIONS ON THE MALE GENERATIVE ORGANS	226	
For phimosis	152	Circumcision.
For paraphimosis	2	
For varicocele	38	
For hydrocele	27	
(1) By tapping	4	
(2) By tapping and injection	5	
(3) Excision of parietal part of sac	18	
Castration	7	2 tubercle; 2 malignant growth; 1 crushed; 1 gangrene; 1 gummata.
OPERATIONS ON THE FEMALE GENERATIVE ORGANS	2	
Curettage of uterus	2	

TABLE XV.—NATIVITIES OF PATIENTS TREATED IN UNITED STATES MARINE HOSPITALS DURING THE FISCAL YEAR ENDED JUNE 30, 1906.

Country.	Number.	Country.	Number.
Total	13,925	Ireland	720
		Italy	81
Africa	9	Japan	30
Argentine Republic	5	Mexico	16
Australia	39	Netherlands	39
Austria	101	Newfoundland	75
Belgium	32	Norway	1,116
Canada	479	Peru	18
Cape Verde Islands	72	Philippines	7
Central America	7	Porto Rico	35
Chile	17	Portugal	65
China	13	Russia	101
Colombia	8	Scotland	211
Cuba	4	Spain	193
Denmark	192	Sweden	694
England	431	Switzerland	17
Finland	352	Turkey	7
France	97	United States	7,867
Germany	507	Wales	17
Greece	63	West Indies	167
Hawaii	41	All other countries	45
India	10		

SANITARY REPORTS AND STATISTICS.

PUBLIC HEALTH REPORTS.

The preparation of statistical reports of States and cities of the United States, based on reports received from State and local health officers, was continued as in previous years and published weekly in the Public Health Reports. Blanks were sent to all cities of the United States of over 10,000 population and to cities of smaller population when especially requested by local health officers. From the returns received from these sources weekly mortality tables were prepared.

Synopses have been presented showing prevalent health conditions in the United States and abroad, and sanitary measures adopted in the United States, its insular possessions, and in foreign countries. Especially detailed reports were given concerning the epidemics of yellow fever in the Gulf States and of Asiatic cholera in Germany and Russia and the sanitary measures taken for the control of these diseases.

Statistical reports of foreign and insular countries and cities were prepared from reports of consular representatives and local health authorities. Weekly foreign mortality tables have also been presented. These tables were prepared from data furnished by consuls on the consular sanitary reports sent weekly to the Bureau.

During the fiscal year tables were prepared giving the mortality statistics of 1,576 cities and towns of the United States for the year ended December 31, 1904, compiled from 1,830 reports received in reply to 3,750 letters sent to local boards of health and health officers. The tables for 1904, which do not include the towns of under 1,000 inhabitants, cover an aggregate population of 23,722,050, according to the United States Census of 1900, which gives the total population of the mainland of the United States as 75,994,575. The population covered, as estimated December 31, 1904, by the Bureau of the Census, is 25,949,540 and locally estimated 27,790,859. Figures from 1,576

of the 3,750 municipalities were utilized, 254 of the 1,830 replies received being incomplete. The grand totals give annual mortality figures for the urban population of the United States for the year 1904, as follows: 18.60 per mille of the United States Census population for 1900, 17 per mille of the Census Bureau's estimated population for the year 1904, and 15.87 per mille of the locally estimated population. The tables show a grand total of 47,781 deaths from tuberculosis in 1904. The tables prepared for the two preceding years gave 41,404 deaths in 1902 from this disease among a population of 22,469,816, based on the official United States Census for 1900, and 43,269 deaths from the same disease in 1903, among a population of 22,400,567, based on the same census.

The present weekly edition of the Public Health Reports is 3,500, of which 600 are kept for binding and 2,900 are used for mailing. The bound reports, which are now issued in two volumes, each of which covers six months, are sent to public libraries, stations of the Service, and to individuals making special requests.

The Service has begun the publication in the weekly Public Health Reports of morbidity as well as mortality reports. The matter of obtaining morbidity reports presents numerous difficulties, and as yet States and localities reporting are comparatively few, but it is believed a plan may be developed and put into operation which will result in the obtaining of these statistics, which are so greatly to be desired.

CHOLERA—STATISTICAL.

The most striking feature in the history of cholera during the fiscal year was its advance from Russia into Germany and Austria. During the preceding fiscal year the southeastern provinces of Russia had been visited by the disease, as a part of the epidemic diffusion that following the initial outbreak in Mekka in 1902 invaded Russia by way of land and sea. The prevalence in Germany is indicated by the following table:

Place.	Date.	Cases.	Deaths.	Remarks.
Germany:	1905.			
General	Aug. 16–Oct. 16...	287	93	Eighteen of 20 suspected cases occurred in the Vistula district; one each in the Warthe River district and the network of canals. There were reported 280 cases with 90 deaths from outbreak to October 21, 1905.
Prussia—				
General	To Sept. 7.....	21	3	
Berlin	Sept. 22.....	1	1	
Alsace Lorraine	Oct. 15.....	1	.....	
Breslau government district.	Sept. 14–19.....	3	1	
Bromberg government district.	Aug. 26–Sept. 19.	37	7	
Dantzic government district.	Aug. 27–Sept. 18.	17	4	
Frankfort government district.	Aug. 31–Sept. 18..	3	1	
Hamburg government district.	Aug. 28	4	2	
Königsberg government district.	Aug. 31–Sept. 5...	3	1	
Marienwerder government district.	Aug. 16–Sept. 23..	29	6	
Mecklenburg-Schwerin government district.	Sept. 9	1	1	
Posen government district.	Sept. 6–16	5	.....	
Potsdam government district.	Sept. 26–Oct. 5....	5	1	
Stettin government district.	Sept. 16–21.....	2	1	

In Austria there were 7 cases not reported as fatal and 3 deaths in September. In Russia many cases, particularly in the Vistula territory, were reported from September to December. In the Vistula territory there were 272 cases, with 144 deaths, from October 22 to November 22. In the governments of Lomza, Plock, and Siedlec and the Petrokov Province there was a considerable number of cases and deaths. The mortality in the government of Warsaw, the city of Warsaw included, was 15 among 23 cases.

In Africa there was only 1 case of cholera reported during the fiscal year, a fatal case at Suez in October.

Asia was as usual the principal seat of cholera, and in India the greatest ravages were wrought. In Madras from July 15 to April 6, 2,717 deaths were reported. At Calcutta reports were received during the fiscal year giving a total mortality of 2,118 from cholera. At Bombay from June 13, 1905, to May 29, 1906, there were 242 deaths.

In China there were 600 cholera deaths reported at Shanghai from June 1 to September 9, 1905. The disease was prevalent in August at Hankow, and there were 4 fatal cases reported at Hongkong during the months of May, June, July, and August. In the Straits Settlements there were a few cases during the summer months of 1905, and in Japan 2 cases were reported at Kobe in July and August.

In the Philippine Islands during the fiscal year there were 359 cases of Asiatic cholera, and 321 deaths at Manila and 4,087 cases and 3,033 deaths in the provinces outside of Manila.

YELLOW FEVER—UNITED STATES—STATISTICAL.

The following table shows the prevalence of yellow fever as reported from July 21 to December 29, 1905:

Yellow fever.

Place.	Date.	Cases.	Deaths.	Remarks.
Alabama:	1905.			
Castleberry	Oct. 15	2	2	
Mobile Bay quarantine	July 24	4		On steamship Columbia, from Colon and La Boca; vessel remanded to Gulf quarantine.
Montgomery	July 28	1		
Florida:				
Brent	Sept. 26	1	1	
Pensacola	Aug. 29–Nov. 16.	564	81	6 cases from German steamship Kaiser.
Tampa	July 28	1		
Georgia:				
Atlanta	Sept. 2–5	1	1	Imported.
Illinois:				
Chicago	Oct. 1–7		1	A refugee.
Indian Territory:				
Maysville	Sept. 1	a1	1	
Kentucky:				
Lexington	Sept. 17	2		Refugees.
Louisiana:				
Acadia Parish—Rayne	To Aug. 17	1		
Ascension Parish—				
Donaldsonville (vicinity of).	Aug. 28–Oct. 18.	27	2	
Port Barrow	Aug. 14–Oct. 7	52	3	
Smokebend	Sept. 23	1		
Total for parish		80	5	

a Disputed.

Yellow fever—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Louisiana—Continued.				
Assumption Parish—	1905.			
Bayou Bœuf and vicinity..	Aug. 26–Oct. 2...	24	.....	
Bayou Lafourche.....	Oct. 16.....	2	.....	
Bayou Louis.....	Sept. 19–Oct. 21..	13	2	
Grosse Tete.....	Sept. 21.....	2	.....	
Plattenville (vicinity of)..	Sept. 30–Oct. 16..	7	.....	
Total for parish.....	.....	48	2	
Avoyelles Parish—				
Borodino.....	Sept. 25.....	1	.....	
Bunkie and vicinity.....	To Oct. 28.....	11	2	
Evergreen (vicinity of)....	Sept. 18.....	2	.....	
Mansura.....	Nov. 11.....	1	.....	
Moreauxville.....	Sept. 18.....	1	.....	
Total for parish.....	.....	16	2	
Caddo Parish—Shreveport detention camp.	To Aug. 14.....	4	.....	
Calcasieu Parish—Bonami	To Nov. 11.....	56	3	New cases reported Oct. 3.
East Baton Rouge Parish—Baton Rouge.	Sept. 9–Oct. 18...	10	1	1 case imported from New Orleans.
East Caroll Parish—				
General.....	Oct. 5.....	.....	.....	Present; number not given.
Atherton.....	Oct. 3–10.....	8	2	
Lake Providence and vicinity.	Aug. 14–Oct. 18..	318	38	
Shelburn.....	Sept. 15–Oct. 26..	15	1	Not official.
Total for parish.....	.....	341	41	
Iberia Parish—				
Jeanerette (vicinity of)...	Oct. 21.....	1	.....	
New Iberia.....	Oct. 12–15.....	13	1	
Total for parish.....	.....	14	1	
Iberville Parish—				
Bayou Goula.....	To Aug. 21.....	2	1	
Elizabeth.....	Aug. 21–Sept. 13.	13	5	
Grosse Tete.....	Sept. 27–Oct. 3...	10	1	
Maringouin.....	Oct. 6.....	1	.....	
New Iberville.....	Oct. 10.....	2	.....	
Rosedale.....	Sept. 27.....	3	1	
St. Gabriel.....	Aug. 31.....	2	.....	
Union plantation.....	Oct. 13.....	1	.....	
Total for parish.....	.....	34	8	
Jefferson Parish—				
General.....	Oct. 19.....	1	1	
Barataria Canal district, (Clark Cheniere, Kintin's Camp, and Cheniere Caminada included).	Aug. 30–Oct. 28..	106	10	Number for Oct. 18 not given.
Bell plantation.....	To Aug. 14.....	1	1	
Estelle plantation.....	Sept. 5.....	3	.....	
Grand Isle (vicinity of)...	Sept. 15–Nov. 3..	53	3	Number not given for Oct. 18.
Gretna.....	Sept. 29–Oct. 17..	9	.....	
Hanson City.....	Aug. 18–Oct. 15..	98	7	
Harveys Canal.....	Sept. 19.....	1	.....	
Kenner.....	Aug. 21–Oct. 21..	172	23	
Larose.....	Sept. 9–17.....	.....	2	
Lower Coast.....	Sept. 23.....	12	.....	
McDonoughville.....	Aug. 18–Oct. 7...	11	.....	
Shrewsbury.....	Aug. 19–Sept. 6..	4	3	
Waggaman (vicinity of)..	To Aug. 20.....	4	2	
Westwego.....	To Aug. 14.....	2	2	
Willswood.....	Aug. 23–Oct. 9...	30	1	
Total for parish.....	.....	507	55	
Lafayette Parish—Lafayette ..	Aug. 15–Sept. 26.	8	.....	

Yellow fever—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Louisiana—Continued.				
Lafourche Parish—	1905.			
Lafourche Crossing	Aug. 14–Oct. 19	16	2	This includes to Nov. 3: cases and deaths at Belle Amie; to Oct. 16: 8 cases, 3 deaths at Bowie; to Nov. 3: cases and deaths at Cote Blanche; to Oct. 16: left side of bayou, 39 cases, 4 deaths; Ludiniere plantation, 9 cases.
Leeville district	Aug. 15–Nov. 3	430	57	
Thibodaux	Oct. 4–6	1	1	
Total for parish		447	60	
Madison parish—				
Milliken's Bend	Sept. 14–Oct. 26	27	1	
Tallulah and vicinity	Aug. 14–Oct. 28	317	18	
Total for parish		344	19	
Morehouse Parish—				
General	Sept. 18		1	
Merrouge	Sept. 16	a1		
Total for parish		1	1	
Natchitoches Parish—				
Bayou Natchez (vicinity of).	To Oct. 28	81	5	
Nachitoches	Sept. 19–20	1	2	
Newton	Oct. 18	1		
Total for parish		83	7	
Orleans Parish—New Orleans	July 21–Nov. 25.	3,395	460	1 case on bark Alaska.
Plaquemines Parish—				
Bayou Cook	Aug. 14–Sept. 3	2	1	
Diamond	Aug. 16	8		
Empire	Aug. 14–26	1		
Greenwood plantation	Sept. 8	1		
Pointe a la Hache	Oct. 2	1		
Pointe Celeste	Aug. 14–Sept. 23.	28	6	
St. Philip	Aug. 14–26	1		
Sunrise	Aug. 15–26	1		
Vaccaro	Aug. 14–26	2		
Woodland plantation	Sept. 8–Oct. 19	15	1	
Total for parish		60	8	
Rapides Parish—				
General	Oct. 3	2		
Alexandria detention camp.	Aug. 15–Oct. 9	19	1	
Lecompte	Sept. 13–18	3		
Total for parish		24	1	
St. Bernard Parish—				
General	Sept. 16–Oct. 9	34		
An Italian village	Sept. 15		1	
Bourgenemouth	Sept. 30	1		
Corinne	Sept. 3	2		
Merritt	Sept. 30	1		
Millaudon	Sept. 30	1		
St. Bernard	Aug. 21–Sept. 18.	12	1	
St. Orys	Sept. 11	1		
Slaughterhouse	Sept. 4–26	10		
Stocklanding	Sept. 12–30	8		
Terre aux Boeufs	Aug. 31–Sept. 14.	7	1	
Toca	Sept. 14	1		
Verrett	Sept. 4	2		
Total for parish		80	3	

a1 disputed.

Yellow Fever—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Louisiana—Continued.				
St. Charles Parish—	1905.			
Cedar Grove	Sept. 16	2		
Diamond plantation (and vicinity).	Aug. 14-18	a 18	3	
Frellsin	Oct. 18	1		
Pecan grove	Aug. 18-Sept. 10.	20	5	
Prospect plantation	Sept. 1-4	4		
Sarpy	Aug. 19-Sept. 23.	13	2	
St. Rose (and vicinity)	Aug. 22-Sept. 29.	61	6	
Total for parish		119	16	
St. James Parish—				
Belmont	Aug. 30	1		
Gramercy	Sept. 1-3	1		
Lutcher	Aug. 15-Sept. 26.	5		
Total for parish		7		
St. John the Baptist Parish—				
Dutch Bayou	Sept. 26	1		
Edgard	Sept. 11	3		
Laplace (and vicinity, including Lions).	Aug. 16-Nov. 11.	163	18	
Lucy	Oct. 11	3		
Reserve plantation (and vicinity).	Aug. 14-Sept. 27.	a 14	2	
Terre Haute	Sept. 9	1		
Total for parish		185	20	
St. Mary Parish—				
Amelia	Aug. 26-Oct. 21.	79	3	
Baldwin	Oct. 20	1		
Bellesein plantation	Aug. 26-Sept. 21.	43	3	
Franklin	Oct. 12-20	4		
Glenfield plantation	Sept. 15	4		
Morgan City	Aug. 14-Sept. 1.	b 3		
Patterson (and vicinity)	Aug. 14-Oct. 20.	530	20	
Riverside plantation	Aug. 14-Sept. 15.	181	8	
Total for parish		845	36	
St. Tammany Parish—				
Abita Springs	Oct. 2	1		
Covington	Sept. 29-Oct. 10	5		1 imported.
Florenville (vicinity of)	Sept. 11		1	
Madisonville	Aug. 19	1		
Mandeville	Aug. 22-Oct. 1	2		
Total for parish		9	1	
Tangipahoa Parish—				
Kentwood	Sept. 17	2		
Tensas Parish—				
Kempsbend	Sept. 17-30	2		1 on Government boat.
St. Joseph (vicinity of)	Sept. 18	3		On Government boat Beta
Waterproof (vicinity of)	Sept. 23	1		On U. S. Grader No. 5.
Total for parish		6		
Terrebonne Parish—				
General	Oct. 16-28	6	1	
Ardoyne plantation	Aug. 14-Oct. 16.	55	3	
Bayou Cane	Sept. 3	1		
Bayou Terrebonne	Sept. 4	1		
Bellegrove	Aug. 31-Oct. 24.	68	5	
Crescent Farm	Aug. 31-Oct. 10.	119	1	
Ellendale	Oct. 7-24	15		
Houma	Aug. 29-Sept. 22.	9		
Moise Settlement	Aug. 31-Oct. 24.	46	3	
Rebecca	Sept. 15-27	12	1	
Smithville	Sept. 9	1		
Southdown plantation	Oct. 23	1		
Total for parish		334	14	

a About. b Disputed.

Yellow fever—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Mississippi:	1905.			
Anguilla (vicinity of)	Sept. 6	1		In a refugee from Vicksburg.
Enoka	Sept. 15	1		
Gulfport	Aug. 15–Oct. 28	120	2	Reporting as North Gulfport in previous Public Health Reports.
Gulf Quarantine	July 22–Oct. 15	41	1	On vessels. 1 from steamship Shetland, remanded from Mobile Bay quarantine station. 1 case from schooner Spy from Scranton for Biloxi,
Hamburg	Sept. 15–Oct. 26	50	8	1 refugee.
Handsboro	Sept. 17–Oct. 6	5		
Harriston	To Sept. 25	2		
Hattiesburg	Aug. 28	1		Diagnosis proved not yellow fever.
Long Beach	Oct. 18	1		
Lumberton	July 28	1		
Mississippi City	Aug. 22–Oct. 17	71		
Moss Point	Sept. 29	3		
Natchez and vicinity	To Nov. 13	143	7	
Pearlington	Sept. 1	2		
Port Gibson	Sept. 27–Oct. 24	63	2	
Rosetta	To Oct. 17	32	7	
Roxie (vicinity of)	To Oct. 26	16	1	
Scranton	Sept. 29–Oct. 1	17		
Soria	Sept. 14–Oct. 5	2		
Sumrall	Aug. 2	1		
Vicksburg and vicinity	Aug. 30–Nov. 29	185	28	
New York:				
New York Quarantine	Aug. 1–12		1	From steamship Advance from Colon.
Ohio:				
Cincinnati	Sept. 15–19	3		Refugees.
Texas:				
Galveston	Dec. 24	1		Imported from Habana.

The only cases of yellow fever in the United States reported during the second half of the fiscal year were as follows:

Place.	Date.	Cases.	Deaths.	Remarks.
Mississippi:	1906.			
Gulf Quarantine	May 30–June 6	3	0	On steamer Whitehall from Colon.
Louisiana:				
Jefferson Parish (Kenner)	Jan. 28	1	0	
Mississippi River Quarantine	June 24	1	0	From steamship Holstein from Habana.

YELLOW FEVER—FOREIGN—STATISTICAL.

In Cuba, during the period covered by the report, yellow fever was confined to Habana and Matanzas Province, with a single case aboard ship at Sagua and one at Real Campina, Santa Clara Province. At Habana there were, from October 16 to June 21, 82 cases and 24 deaths, and in Matanzas Province 12 cases, not reported fatal, and 3 deaths. A case occurred at Curaçao, Dutch West Indies, in October, 1905.

In Mexico yellow fever was reported in the States of Oxaca, Vera Cruz, and Yucatan, including among other places Tehuantepec, Tuxtepec, Coatzacoalcos, Tierra Blanca, Vera Cruz, and Merida. There was one case and one death recorded in the City of Mexico.

In Central America the disease was present in British Honduras, Guatemala, Honduras, Nicaragua, and Costa Rica. In British Honduras there were a few cases at Belize between June and November.

In Guatemala it was estimated that there were 200 deaths from yellow fever at Gualan from August to November, and 700 deaths at Zacapa in August and September. At Livingston there were 27 cases and 12 deaths from June 10 to October 14, and the disease was present at Tucuru in August. Honduras suffered an extensive visitation during the fiscal year, the principal prevalence being at San Pedro, Chamelicon, Choloma, and in the vicinity of Puerto Cortez. During the first week in August, 1905, yellow fever was reported present at Managua, Nicaragua, and shortly thereafter Leon, Corinto, and Granada, and later San Francisco, in northwest Nicaragua, were reported infected. In Costa Rica there was a single case at Limon, June, 1906.

In Panama 54 cases and 17 deaths were reported from June 16 to May 22. At Bocas del Toro there were 13 cases in August, September, and October, and a death in February from yellow fever. At Panama 68 cases with 33 deaths were reported from June 16 to November 20 and there were a few cases in June, 1905, at Corozal, Empire, La Boca, and Paraiso.

From South America there were reports of yellow fever in Colombia, Venezuela, French Guiana, Ecuador, Peru, Brazil, and Argentina. Brazil was the chief sufferer, many cases having occurred at Rio de Janeiro and Para, and a few at Manaos, and São Paulo. In Ecuador, there were numerous cases at Guayaquil, and in Argentina at Buenos Ayres. A few cases were reported at Baranquilla and Cartagena, Colombia; Maracaibo, Venezuela; St. Jean du Maroni, French Guiana, and Callao and Pezano, Peru.

Outside the Western Hemisphere the only case of yellow fever reported was one on board ship at Santa Cruz de Teneriffe, Canary Islands, and a single death at Goree-Dakar, Africa.

BUBONIC PLAGUE—STATISTICAL.

The only cases of plague present in the United States during the fiscal year were 2 cases and 1 death on the steamship *Burnsfield*, April 6 to 11, 1906, at Reedy Island Quarantine, Delaware. The vessel came from Bombay via Algiers and Oran. In Hawaii there were a few cases during the year, principally at Honolulu. Reports from the Philippine Islands gave 24 cases and 23 deaths at Manila, and 10 cases and 7 deaths at Cebu. In Panama there were 2 deaths from plague at La Boca in July and August, 1905. The malady was epidemic in Peru, chiefly at Lima, Mollendo, Paita, Nueva Choseca, Reque, and in the Trujillo district. Fourteen cases and 4 deaths were reported at Callao during the year. In Chile the principal prevalence was at Antofagasta, but there were 11 cases at Taltal in August, 1905, and in May, 1906, the disease was present at Iquique and Tacna. Brazil suffered extensively. At Rio de Janeiro 307 cases and 117 deaths were recorded, at Pernambuco 60 deaths were reported, at Bahia there were 34 cases and 10 deaths, and the disease was also present at Maranhão, Campos, Porto Alegre, Rio Grande do Sul, and São Paulo. In Argentina plague was present at Choya, Santiago del Estero, and in Santa Fe Province. There were cases at Asuncion, Paraguay, in March and April, 1906. Plague in Europe, excepting a single case in June, 1905, on board ship at Manchester, England, was confined to Russia, where, between November 19, 1905,

and February 1, 1906, 687 cases and 656 deaths were reported. In Africa there was plague in Egypt, British East Africa, British South Africa, and Portuguese East Africa. Zanzibar and the island of Mauritius suffered severe visitations. The most important prevalence in Egypt was at Alexandria. In Cape Colony the disease was present in East London, King Williams Town, Port Elizabeth, and Queenstown. The epidemic at Chinde, Portuguese East Africa, numbered 60 cases and 41 deaths. In British East Africa there were 4 cases at Nairobi in January, 1906. The chief Asiatic prevalence of bubonic plague was, as usual, in India, where 380,387 cases and 316,479 deaths from the disease were recorded during the fiscal year. There were 576 cases and 512 deaths from plague at Hongkong, and the disease was also present elsewhere in China, among other places at Amoy, Antung, Canton, and Fuchau. There were many cases in Japan, notably at Kobe and Osaka. There was an epidemic at Seistan, Persia, and cases were present at Adalia, Turkey, and Aden, Arabia. There were a few cases at Singapore and Wellesley, in the Straits Settlements, and at Bangkok, Siam. The Island of Formosa suffered extensively.

SMALLPOX—STATISTICAL.

This disease, as shown in the published tables, was widely diffused over the United States, prevailing in forty-three States, one Territory, and the District of Columbia, with a total of 10,554 cases and 122 deaths reported. There has been an apparent steady annual decrease, however, since 1902, in which year the number of cases was 55,857 and deaths 1,852, as reported. From August to November there were over 500 cases at Pensacola, Fla., and Jacksonville, Fla., also suffered from an extensive visitation. At San Francisco there were many cases in the winter, 1905–6. Allen County, Ind.; Carroll County, Iowa; Mitchell, Montgomery, Republic, and Sedgwick counties, Kans.; New Orleans, La.; Currituck, Hertford, Hyde, Perquimans, and Washington counties, N. C.; Hamilton County (Cincinnati), Ohio; Shelby County, Tenn.; Salt Lake County (Salt Lake City included) and San Pete counties, Utah, and Norfolk County (Norfolk and Portsmouth included), Va., were the seats of epidemics. There was also a wide extension in foreign countries. In the City of Mexico there was a small epidemic. From Brazil many cases were reported, the epidemic at Pernambuco causing between 3,000 and 4,000 deaths. At Rio Grande do Sul, Para, Rio de Janeiro, and Bahia the disease caused great mortality. At Valparaiso, Chile, the disease wrought great ravages, causing over 5,000 deaths among nearly 12,000 cases. At Antofagasta, Chile, there was also a considerable prevalence. In Europe the prevalence of the disease was not unusual. In Africa the most important epidemic was at Cape Town, and in Asia India was the seat of an epidemic centered particularly in Calcutta, Rangoon, and Madras.

Medical Inspection of Immigrants.

A total of 1,175,000 arriving aliens were examined by medical officers of the Service to determine their physical fitness for entrance into the United States and its dependencies, Porto Rico, Hawaii,

and the Philippines. Twelve commissioned officers and 30 acting assistant surgeons were engaged in this examination. Medical officers were detailed for the same purpose at foreign ports, viz, Naples, Quebec, St. Johns, New Brunswick, Winnipeg, Victoria, and Vancouver. The officers on quarantine duty in Japan and China also inspected aliens at the request of the Department of Commerce and Labor, this work at some ports exceeding in importance and labor the quarantine function.

The good results of examination of intending immigrants at foreign ports is seen in the reports of the several officers there stationed. It should be borne in mind that the medical officers have no legal right to forbid undesirable immigrants embarking at the foreign port, but they inform the steamship companies that certain aliens whom they have examined will be subject to deportation if carried to United States ports. The steamship companies are subject to a fine in such cases, besides the expense of returning the immigrants.

But, as shown by the reports of the officers at Naples and Hongkong, this foreign inspection is not a perfect safeguard. Fraud is exercised despite the greatest vigilance, and the rigid examination at the ports of arrival in the United States must be the chief reliance for the exclusion of those afflicted with loathsome or contagious disease.

Yet the examination at the foreign ports is of exceeding value, not only to the Immigration Service, but to the steamship lines and to the would-be immigrants themselves. At Naples, during the five years ending June 30, 1905, 27,834 would-be immigrants were rejected, thus being saved a voyage to the United States and a return voyage, the steamship companies being saved the expense of returning them. For the fiscal year 1906 there were 15,362 would-be immigrants rejected at Naples and at the subports of Messina and Palermo. At Hongkong 965 were rejected; at Yokohama, 16,626, and at Kobe, 4,880.

The reports show how extensive are certain special diseases in foreign countries and the great work done by Service officers in preventing cases coming to the United States. A principal disease is trachoma, which prevails very extensively in Japan and China, in southern Italy, Sicily, Sardinia, Egypt, and Syria. More than 29,600 cases of trachoma were barred at foreign ports during the fiscal year, and more than 1,600 immigrants with this disease were rejected at domestic ports.

The medical officers in the United States engaged in the exclusive duty of examination of arriving aliens are so detailed in accordance with the act of Congress approved March 3, 1903, entitled "An act to regulate the immigration of aliens into the United States," section 17. Their relation to the Immigration Service is set forth in rule 26, immigration regulations, approved February 2, 1906. They are under the general direction of the immigration commissioners at the several ports, subject, however, to the Public Health and Marine-Hospital Service regulations governing the medical inspection of aliens, as approved by the Secretary of the Treasury November 18, 1902.

At the larger immigration stations the methods and system are such that while the inspections are apparently rapidly made they

are in reality searching and thorough. By perfection in arrangement of details, and by reason of long practice, the officers are able to detect promptly cases which present even probable physical causes for rejection, and these are made to stand aside to be examined more at leisure and in detail. The examining medical officer in case of doubt has recourse to a board of officers of the Public Health and Marine-Hospital Service for which provision is made by regulation, and in the event of certification for deportation there is provision in the immigration regulations for a board of special inquiry, of which a Service officer is generally a member.

Special attention during the year has been given to the detection of mental diseases of arriving aliens, and officers have been detailed for duty at Ellis Island with special knowledge and training in the detection of such diseases. To still further add to the efficiency of this class of examinations, arrangements have been perfected with the authorities of the Government Hospital for the Insane at Washington, D. C. (St. Elizabeth's), by which officers of the Service will be received in that institution for such period as may enable them to become expert in mental disorders. They will render service without further compensation from the institution than their quarters, subsistence, and laundering. The details will be made from the Service to St. Elizabeth's as frequently as may be necessary to ensure a competent corps of alienists at the Ellis Island or other immigration station. A further arrangement provides for the appointing of physicians from the St. Elizabeth's staff for temporary duty at Ellis Island.

Following is a summary of the transactions at the several ports, both domestic and foreign:

Boston, Mass.—Surg. R. M. Woodward reports 68,182 aliens inspected, of whom 654 were certified as presenting physical causes for rejection. One hundred and ninety were deported, 73 having excludable diseases and 117 being deemed likely, on account of physical disability, to become public charges. In addition to these aliens and 12,285 citizens of the United States arriving at the port of Boston, there were also examined on arrival about 40,000 alien seamen. These latter examinations were made under instructions from the commissioner of immigration at Boston, as follows: "Alien seamen who are discharged, or are to be discharged, or who have deserted their vessel at a port of the United States with any other object in view than departing, as described in the next preceding paragraph, are in no respect to be distinguished on account of their prior calling or occupation as seamen from other aliens seeking admission into this country, either as regards collection of head tax on their account or as respects the examination and determination of their right to remain under the various acts regulating immigration." "All other aliens signed on the ship's articles shall be examined, and in all respects regarded as alien passengers." Out of slightly more than 500 first-cabin passengers examined there were found 10 cases of trachoma, 2 of insanity, and one of epilepsy, and among 8,000 alien second-cabin passengers examined 646 were found physically defective. The proportions of defectives were 8 per cent in the second cabin as compared with 5 per cent in the steerage. The physical conditions leading to debarring from landing were "very poor physique," "debility," "deafness," "anæmia," "defective vision," "hernia," "very defective vision," etc. Mental causes of

incompetency were "aphasia," "mental impairment," "physical degenerate," "epilepsy, mental deficiency and partial paralysis," "mentally deficient," "epilepsy," etc. During the year 54 cases of trachoma were certified for deportation. Three hundred and fourteen cases were sent to hospital.

Brownsville, Tex.—Acting Asst. Surg. J. H. Florence reports 42 aliens inspected, 18 being certified as presenting physical causes for rejection, of whom 10 were deported. Among those deported were 2 cases of trachoma and 1 case of favus.

Buffalo, N. Y.—Surg. D. A. Carmichael reports 2,054 aliens inspected, 48 being certified as presenting physical causes for rejection, all of whom were deported. Among the causes for deportation were: Trachoma, 34; favus, 6; tuberculosis, 1.

Charleston, S. C.—Acting Asst. Surg. F. T. Sams reports 1 alien inspected and passed.

China—Hongkong.—Passed Asst. Surg. M. J. White reports 3,844 aliens inspected, 965 of whom were rejected. Of those rejected, 942 were cases of trachoma and 1 tuberculosis.

China—Shanghai.—Acting Asst. Surg. S. A. Ransom reports 112 aliens inspected, 11 of whom were rejected—9 for trachoma and 1 tuberculosis.

El Paso, Tex.—Acting Asst. Surg. E. D. Sinks reports 32,436 aliens inspected, of whom 517 were certified as presenting physical causes for rejection, all of whom were deported. Among the causes for deportation were: Trachoma, 442; tuberculosis, 1; favus, 2. He states that for the last three months of the fiscal year numerous Assyrians have been seeking entrance into the United States via Mexico. It is reported that trachoma is very prevalent among these aliens, and that at the time of the report there were about 75 of them in Juarez, Mexico, awaiting entrance into the United States, of whom 45 had already been certified and deported on account of the disease.

Everett, Wash.—Acting Asst. Surg. James Chisholm reports 5 aliens inspected and passed.

Hawaii—Honolulu.—Passed Asst. Surg. L. E. Cofer reports 10,536 aliens inspected, 126 detained for diagnosis, 50 of whom were certified as presenting physical causes for deportation and deported therefor. Among the causes for deportation were 46 cases of trachoma.

Italy—Naples.—Passed Asst. Surg. Allan J. McLaughlin makes the following report of the transactions of the Service at the ports of Naples, Messina, and Palermo, covering the period from July 1, 1905, to June 30, 1906, inclusive:

Statistics of the Service at Naples, Messina, and Palermo.

Month.	Ships.	NUMBER OF EMIGRANTS.			BAGGAGE.	
		Naples.	Messina.	Palermo.	Inspected.	Disinfected.
1905.					*Pieces.*	*Pieces.*
July	17	10,308	519	1,837	1,938	17,925
August	18	10,254	283	2,488	2,330	18,655
September	21	13,361	296	2,730	3,831	20,855
October	22	11,683	267	1,919	4,139	19,425
November	25	10,156	108	899	2,748	15,695
December	16	6,173	84	779	1,634	10,286
1906.						
January	19	6,503	161	1,902	2,023	11,308
February	31	23,795	277	2,165	3,604	33,851
March	30	35,766	184	676	3,151	47,641
April	34	33,039	502	4,506	8,923	49,426
May	31	35,851	138	2,035	7,450	50,479
June	28	24,319	829	4,306	8,771	33,595
Total	292	221,208	3,643	26,242	50,542	329,141

Rejections recommended.

Month.	Trachoma.	Favus.	Suspected trachoma.	Suspected favus.	Measles.	Smallpox.	Other causes.	Total.
1905.								
July	527	21	307	5	4	.....	66	903
August	632	21	476	6	.....	.....	93	1,228
September	688	40	450	33	.....	.....	105	1,316
October	578	58	243	24	1	.....	70	974
November	581	55	234	10	1	.....	63	944
December	330	21	153	8	.....	.....	38	550
1906.								
January	404	24	204	16	.....	.....	59	707
February	535	53	426	31	.....	.....	113	1,158
March	458	87	503	44	.....	.....	161	1,253
April	820	142	950	130	.....	.....	181	2,223
May	712	94	737	196	3	1	216	1,959
June	988	89	759	117	2	.....	165	2,120
Total	7,253	705	5,442	620	11	1	1,330	15,362

The scope of work may be considered under two heads, namely—quarantine work and immigratoin work—but these two functions are closely related, and the carrying out of the United States quarantine and immigration laws goes on without any sharp division of the work.

The personnel of the station is as follows:

Naples.—Passed assistant surgeon, A. J. McLaughlin; assistant surgeon, A. D. Foster; acting assistant surgeon, Enrico Buonocore; clerk, Mr. R. F. St. Leger.

Palermo.—Acting assistant surgeon, Ignazio Di Bartolo.

Messina.—Acting assistant surgeon, Sebastiano Tornatola.

The excellent organization of the station provides for expansion when necessary at the minimum of expense to the United States. For example, an additional officer, Dr. Federico Reale, trained according to Service ideas, is available at any time and is paid by the day only when employed.

The list given above does not give the full personnel of this station, but only those paid by the United States. In addition there is a chief inspector and six assistant inspectors, solely under the direction of the office, who sort out the baggage for disinfection, affix the labels, stamp the emigrants' inspection cards after the medical inspection, and assist the medical officers in preventing evasion of inspection. These inspectors are paid by the steamship companies. The vaccinators are physicians employed by the steamship companies, but the vaccination is under supervision and subject to approval. Similarly the acting assistant surgeons at Messina and Palermo are paid only when actually employed. The wisdom of this arrangement was proved last

September when, owing to the outbreak of cholera in Germany, the station was suddenly stripped of both commissioned medical officers. September 2 the senior medical officer received orders by cablegram to proceed immediately to Hamburg, where Asiatic cholera had appeared, to enforce United States quarantine regulations. A few days later Assistant Surgeon Foster received orders to proceed to Trieste and Fiume, leaving the station in charge of Acting Asst. Surg. Enrico Buonocore. The organization of the station is such that no confusion resulted. Not only was the inspection for emigration purposes carried on as usual, but Russians and others from cholera-infected districts were detained, and the United States regulations against cholera strictly enforced. In addition, the Service was enabled to have a representative in Hamburg making an investigation within seventy-two hours.

No quarantinable disease was officially reported in Naples during the year. Smallpox has been prevalent throughout the year in Sicily and some parts of Italy, also at Piræus, Greece. Special attention has been paid to the vaccination of emigrants before embarkation. Because of the prevalence of smallpox it has been found necessary to disinfect nearly all baggage. Reports of the infected places in Italy, Sicily, Greece, and other neighboring countries are received weekly from the Italian sanitary bureau at Rome and from various American consuls. A limited amount of clean baggage is inspected and passed without disinfection, based upon these official reports. Plague existed in Egypt during the year, but no cases were brought to Naples, in spite of the close commercial relations existing between this port and Alexandria. A few Russians came to Naples after September, doubtless deflected from their usual course by the restrictions imposed in accordance with the United States quarantine laws at Hamburg and other ports because of cholera.

The steamship companies in Naples were notified to report at once arrival of Russians intending to embark for the United States. These were placed in separate boarding houses, bathed, their clothing and baggage disinfected, and they, before being permitted to embark, were held under observation at least five days.

The inspection is made in the capataneria, a large building upon the water front, in which the captain of the port has his office. The disinfecting plant is opposite the capataneria and the vaccinating rooms also within a very short distance, so that the three operations of inspecting, disinfecting, and vaccinating are easily supervised.

The medical inspection is made immediately before sailing by the American officers in the presence of the Italian emigration commission. Usually there are present a doctor of the port, an inspector of emigration, a commissarion regio, representatives of the chief of police, and the doctor of the ship about to sail.

The commissario regio is an officer of the Italian navy or army, usually a medical officer, who under the Italian emigration law accompanies the emigrants on board ship to their port of arrival in America. He looks after the welfare of the emigrants, as a representative of the Royal Government, and requires the carrying out of the provisions of the Italian emigration law. There are police officers in uniform and in plain clothes and a squad of carabinieri reali, or military police, to keep the crowd in order. The emigrants are arranged in line, and the examination is divided between two Service officers as at Ellis Island, one examining eyes and the other scalp and other defects. The rejected are set aside, and the emigrant who presents no defect passes from the doctor to one of our inspectors, who writes across the face of his card a letter of the alphabet or other sign, which is changed for each ship. This signifies he has passed the doctor. The emigrant then passes the Italian police, who question him and compare his answers with his passport. If he passes the police, he goes to the outer inclosure, where his disinfected baggage awaits him. From this point he goes on board a tender or tug and is brought to the gangway of the ship. At the head of the gangway he encounters another of our inspectors, who scrutinizes his card, sees that it is properly marked, and that his baggage is properly labeled "Disinfected" or "Passed," and stamps his card finally with the American consular seal. In spite of these precautions and the best efforts of the personnel of this station, it has been impossible to prevent evasion of the medical inspection.

The average Italian emigrant, ignorant and child-like in his credulity, believes that if he once sets foot upon the deck of the vessel his troubles will be over and he will enter the United States without further examination. He either knows nothing of the examination at New York or Boston or he is in-

formed by the human vultures who prey upon the emigrants that the examination at the American ports is a farce. These scoundrels lie in wait for the rejected emigrants outside the place of inspection and offer for a sum of money to place them on board the ship. The most common method of effecting this is as follows: A Neapolitan, who has no disease which will exclude him and who has no intention of going to America, takes the tickets and the inspection card of the diseased emigrant, and passing the doctors has his inspection card marked by the inspector as regularly passed. He passes out with the other emigrants to where the disinfected baggage is claimed, and somewhere between this point and the ship passes the card and tickets to the diseased emigrant and slips off in the crowd. The diseased alien then goes aboard the ship. This exchange of cards is facilitated by the fact that ships do not come to the dock, but anchor in the bay perhaps half a mile from the capataneria. Another way is to smuggle emigrants on board without the tickets and cards and deliver the cards with a forged mark upon them later. As the mark is changed for each steamer this occasions a little delay. The forger obtains in some way a properly marked inspection card and imitates the letter inscribed thereon upon the cards obtained for the diseased ones. The emigrants so smuggled on board are not always diseased, but the sharper who takes their money assures them that they have trachoma, and if they will pay him a certain sum he will have them placed on board without inspection by the "American doctor." These men, who make a business of defrauding emigrants and evading our inspection, probably know that the emigrant will be detected at New York or Boston, but that is a secondary consideration after they get the poor deluded creature's money. Such attempts at substitution are detected almost daily, but undoubtedly some attempts are successful, which explains the detection of cases of trachoma at New York or Boston among emigrants from Naples, whose eyes were so badly diseased that the disease could have been detected by a layman and could not possibly have passed our inspection here.

From the foregoing it is plain that a foreign inspection alone can never protect the United States against aliens with trachoma, favus, etc. Without the examination at Ellis Island or other ports the examination here would have little value against the unscrupulous persons who make a business of evading our emigration laws.

The evils of substitution and other means of evading inspection here concern the deluded emigrant and the authorities whose duty it is to protect him, the steamship companies, and least of all the United States. The emigrant so deceived upon being returned from Ellis Island often makes complaint to the authorities here stating the amount of money he paid for evading inspection. The steamship companies pay fines for many of these cases, and consequently are very directly concerned in preventing these evils. The United States is, of course, anxious to prevent such evasion of its foreign inspection, but is efficiently protected by the rigid inspection made at our American ports.

I wish to emphasize two points in this report: First, the impossibility of completely preventing substitution of diseased for healthy aliens who have passed our inspection; second, the steady persistent increase of emigration. The total number from Naples last year was 221,208, and, with Palermo and Messina, was over a quarter of a million. The amount of rejections also shows increase, reaching a total for all causes of 15,362. The amount of baggage controlled was enormous—329,141 pieces disinfected by steam and 50,542 inspected.

The increase over last year is shown below:

Year.	Number of emigrants.	Baggage.		Rejections recommended.
		Disinfected.	Passed.	
		Pieces.	*Pieces.*	
1904–5	189,117	253,206	21,567	4,956
1905–6	251,093	329,141	20,542	15,362

Japan—Yokohama.—Passed Asst. Surg. Hugh S. Cumming reports 26,760 aliens (would-be steerage passengers) inspected to determine their freedom from loathsome or dangerous contagious disease, insanity, etc., 10,134 of whom were passed as free from such

diseases. Of those rejected 2,150 were afflicted with trachoma. This disease is reported by Doctor Cumming to be extensively prevalent in Japan, but he has been unable to obtain full statistics.

Japan—Kobe.—Acting Asst. Surg. D. Ross Kilpatrick reports 8,306 aliens inspected, 4,880 of whom were rejected. Of those rejected 4,879 were cases of trachoma.

Key West, Fla.—Acting Asst. Surg. J. N. Fogarty reports 6,336 aliens inspected, 27 being certified as presenting physical causes for rejection and 11 deported, of which 6 were cases of trachoma.

Malone, N. Y.—Acting Asst. Surg. S. D. Williamson reports 363 aliens inspected, 6 of whom were certified as presenting physical causes for rejection. Four were deported, all of whom were cases of trachoma.

Naco, Ariz.—Acting Asst. Surg. B. C. Tarbell reports 2,933 aliens inspected, of whom 37 were certified as presenting physical causes for rejection and deported therefor. Among the deportations were 5 cases of tuberculosis and 3 cases of trachoma.

New Orleans, La.—Surg. J. H. White reports 2,631 aliens inspected, 95 being certified as presenting physical causes for rejection, 22 of whom were deported. Of the causes for deportation 15 were trachoma and 1 tuberculosis.

New York, N. Y.—Surg. G. W. Stoner reports 935,860 aliens inspected, 7,573 being certified as presenting physical causes for rejection, 2,920 of whom were deported. Among the causes for rejection were trachoma, 802; tuberculosis, 41; favus, 63; leprosy, 1.

Summary of hospital transactions, fiscal year ending June 30, 1906.

Number of patients in hospital at beginning of year	213
Patients admitted to hospital during year	7,464
Total treated: Men, 3,030; women, 1,853; male children, 1,476; female children, 1,318	7,677
Births: Male, 11; female, 7; total	18
Deaths: Men, 40; women, 19; male children, 142; female children, 126; total	327
Pay patients treated during the year	7,669
Free patients treated during the year	8
Days' treatment for pay patients	87,870
Days' treatment for free patients	289
Total days' treatment for hospital cases	88,159
Daily average number of patients in hospital	242
Patients in hospital at end of year	310

Detailed report of hospital transactions.

Hospital.	Remaining from previous year.	Admitted to hospital during the year.	Total treated.	Recovered.	Improved.	Not improved.	Died.	Remaining at end of year.	Days' treatment.
Immigrant hospital	94	4,913	5,007	3,188	608	1,048	49	114	33,542
Health department	62	1,590	1,652	1,263	.....	.....	235	154	40,790
Long Island College	57	940	997	639	67	207	43	41	12,969
St. Vincent's	0	21	21	18	.....	2	.....	1	858

Nativity and race of immigrants certified for trachoma during year ended June 30, 1906.

Nativity.	Albanian.	Arab.	Armenian.	Bohemian.	Bulgarian.	Croatian.	Dutch.	English.	Finnish.	French.	German.	Greek.	Hebrew.	Irish.	Italian, south.	Italian, north.	Lithuanian.	Magyar.	Persian.	Polish.	Portuguese.	Roumanian.	Ruthenian.	Russian.	Scandinavian.	Servian.	Slovak.	Spanish.	Syrian.	Turkish.	African, black.	Total.
Austria-Hungary				4		15					15		18					9		27			14			2	36					140
Bulgaria					2																											2
Denmark																									2							2
Germany											12		1							6												19
Greece												24																				24
France										3																						3
Italy															198	13																211
Morocco		5																														5
Netherlands							2																									2
Norway																									1							1
Persia																			8													8
Portugal																					1											1
Roumania													8									1										9
Russia									1		22		82				63			75				5								248
Spain																												7				7
Sweden																									8							8
Turkey	13		19										2																	87	5	126
United Kingdom							2						2	7																		11
West Indies																												5			4	9
Total	13	5	19	4	2	15	2	2	1	3	49	24	113	7	198	13	63	9	8	108	1	1	14	5	11	2	36	12	87	5	4	836

Work of the medical examiners.

Steerage passengers inspected upon arrival (of this number 23,948 proved to be United States citizens)		837,060
Cabin passengers inspected upon arrival (of this number 112,007 proved to be United States citizens)		234,755
Sent to hospital:		
Upon arrival	7,456	
Warrant cases	8	
		7,464
Certified on account of loathsome or dangerous contagious disease or other physical causes (steerage)		6,914
Recorded, minor defects (steerage)		28,584
Cabin passengers certified		659
Cabin passengers recorded, minor defects		718

Nogales, Ariz.—Acting Asst. Surg. A. L. Gustetter reports 1,951 aliens inspected, of whom 8 were certified as presenting physical causes for rejection. Among the 8 thus certified were 4 cases of trachoma and 1 case of tuberculosis.

Northport, Wash.—Acting Asst. Surg. R. S. Wells reports 1,796 aliens inspected, 110 being certified as presenting physical causes for rejection, of whom 64 were deported. Among the causes for deportation were 34 cases of trachoma and 1 case of favus.

Philadelphia, Pa.—Surg. Fairfax Irwin reports 23,918 aliens inspected, 712 being certified as presenting physical causes for rejection, of whom 80 were deported. Among the causes for deportation were trachoma 34, favus 7, tuberculosis 2.

Philippine Islands.—Passed Asst. Surg. Victor G. Heiser reports 2,272 aliens inspected at Manila, 19 of whom were certified as presenting physical causes for rejection and deported therefor. At Iloilo 274 were inspected, 3 of whom were in like manner certified and deported. At Cebu 41 were inspected, 1 being certified and deported. At Zamboanga 136 were inspected and passed. At Jolo 137 were

inspected and passed. Of the 19 deported at Manila all were cases of trachoma, and of the 4 deported at the other ports 2 were cases of trachoma and 1 tuberculosis.

Porto Rico—San Juan.—Passed Asst. Surg. M. H. Foster reports 1,608 aliens inspected, of whom 2 were rejected for physical causes.

Quebec and St. John, New Brunswick.—Surg. C. P. Wertenbaker reports 15,658 aliens inspected, 273 being certified as presenting physical causes for rejection, of whom 54 were deported. Of the number deported, 41 were cases of trachoma and 3 favus.

Richford, Vt.—Acting Asst. Surg. J. H. Hamilton reports 127 aliens inspected and passed.

San Diego, Cal.—Surg. S. D. Brooks and Acting Asst. Surg. W. W. McKay report 720 aliens inspected, of whom 13 were certified as presenting physical causes for rejection and deported therefor. Four of those deported were cases of trachoma.

San Francisco, Cal.—Passed Asst. Surg. F. E. Trotter reports 8,836 aliens inspected, 768 being certified as presenting physical causes for rejection, of whom 127 were deported. Among those deported were 120 cases of trachoma.

Doctor Trotter also reports 7,473 alien seamen examined, of whom 847 were certified as presenting physical causes for rejection, 72 were landed, 29 deported, 103 deserted, 2 died, 9 were reshipped, and 6 were returned by the consul. Chinese seamen to the number of 6,527, who arrived during the fiscal year, were not examined.

Savannah, Ga.—Acting Asst. Surg. E. S. Osborne reports 27 aliens inspected, of whom 2 were certified as presenting physical causes for rejection and deported therefor.

Tacoma, Wash.—Acting Asst. Surg. F. J. Schug reports 963 aliens inspected, of whom 58 were certified as presenting physical causes for rejection and deported therefor. Of those deported 42 were cases of trachoma and 1 tuberculosis.

Vancouver, B. C.—Passed Asst. Surg. M. W. Glover reports 3,567 aliens inspected, 194 being certified as presenting physical causes for rejection, of whom 164 were deported. Of those deported 150 were cases of trachoma.

Winnipeg, Canada.—Acting Asst. Surg. H. J. Watson reports 3,842 aliens inspected, of whom 64 were rejected for physical causes. Of the 64 rejected 36 were cases of dangerous contagious diseases.

Foreign and Insular Quarantine.

The following are reports from officers detailed to certain foreign ports in the offices of the American consuls, for the purpose of making inspection and signing bills of health in conjunction with the consuls, of vessels bound for the United States, its possessions, or dependencies.

The reports from Porto Rico, Hawaii, and the Philippine Islands are reports from national quarantine stations under the administration of the Department through the Public Health and Marine-Hospital Service.

PANAMA.

COLON.

Acting Asst. Surg. H. B. Mohr, detailed by direction of the President for duty in the office of the American consul at Colon, transmits a report, which is in part as follows, including also a brief outline of the sanitary work done on the Isthmus during the fiscal year ended June 30, 1906:

It will be seen that the movement of vessels from Colon to ports in the United States has considerably increased. Between New York and Colon there are now three lines. Plying between Colon and New Orleans are three lines.

Besides these regular lines many tramp steamers arriving at this port clear for ports in the United States via ports in Cuba, and a number of sailing vessels clear from here for ports in the southern United States.

All vessels, steamships, and sailing vessels clearing for ports south of the southern boundary of Maryland, as also those clearing for ports in the United States via Cuba, are fumigated with sulphur in open harbor prior to sailing. This fumigation includes the holds and all other compartments of the ship, with the exception of the engine rooms. Sulphur, in the proportion of 2 pounds to the 1,000 cubic feet, is burned and the compartments kept closed for two hours. Crews and passengers on all vessels are carefully inspected just prior to sailing.

The process of fumigation in the harbor of Colon is at times attended with difficulty, owing to the character of the harbor, almost an open roadstead, which is exposed to sudden squalls and frequently to a heavy sea. Vessels lying at anchor in the open harbor are compelled to keep up steam at all times, which excludes any attempt at fumigation of the engine rooms. Stress of weather sometimes necessitates the fumigation being done while the vessel is moored to the pier, the compartments not being opened until the vessel is ready to cast off its moorings. Difficulty has also been experienced by vessels not possessing the necessary equipment and material for fumigation, and there is no supply in the town from which to draw, excepting such as can be obtained through the courtesy and cooperation of the quarantine service of the Isthmian Canal Commission. Under such circumstances the equipment must be carried to and from the ship in a small boat, often when a heavy sea is running, at no little risk.

An arrangement has been effected between the agents of the Leyland Steamship Line and the health authorities of Kingston, Jamaica, by which the vessels of this company are fumigated at that port prior to sailing for New Orleans.

It is worthy of remark that during the past six months the health among the crews on vessels lying at the docks in this port has been exceptionally good. A few cases of malarial fever have been observed, and these have all yielded promptly to quinine treatment.

It is now two years since the Isthmian Canal Commission assumed charge of the sanitation of the cities of Panama and Colon and the territory denominated as the Canal Zone, and during that time an enormous amount of work has been done, with undoubted good results.

The work showing the most positive results has been done in the Canal Zone along the line of the railroad and the canal, this territory being under the absolute control of the sanitary department, in which a system almost military in its organization could be maintained. Panama and Colon, under the jurisdiction of the Panama Government, presented unique difficulties in the way of popular prejudice against foreign methods and the deep-rooted customs of a mixed population—customs which for years past have been anything but hygienic.

Panama city during the year has had its principal streets and thoroughfares graded and paved with vitrified brick; a water system, furnishing an ample supply of good water, filling a long-felt want, has been installed, and a good system of sewerage has been laid throughout the city.

A force of inspectors is employed to visit the houses and hotels in which foreigners and nonimmunes reside, for the purpose of keeping the health office advised as to the occurrence of any sickness amongst them. A report of the condition of each house is filed daily.

House-cleaning forces are employed in disinfecting—by thorough scrubbing, the use of bichloride of mercury and whitewash—the houses occupied by the indigent classes.

The more important towns along the line have also been supplied with water and sewerage systems. The benefits to be derived from these innovations in a country where ankylostomiasis prevails to a large extent can not be overestimated.

The sanitary department can justly point with pride to the hospitals established for the care of the sick at the terminals and along the line of the canal. The hospital at Ancon, the Pacific terminal, is model in every particular, consisting of numerous pavilions situated on the brow of a hill, which permits of perfect drainage. Its wards contain over 500 beds, and its operating room is second to no hospital of its size in the United States. The management and its corps of physicians consist of men of wide experience and tried ability. Colon Hospital, of over 300 beds, is not yet entirely completed, but it promises to outrank even Ancon Hospital in its perfect arrangements. Out on the line proportionally large hospitals have been established, the largest being at Culebra, where the greatest number of men are concentrated. The wards in these hospitals are large, well ventilated, and screened throughout, and well arranged for the isolation of contagious diseases. Ancon and Colon have well-equipped laboratories for experiment and research. Comparing the present hospital system with that in vogue during the régime of the French Canal Company, one is profoundly impressed with the progress made in medical science and sanitation in the last quarter of a century. An important feature in connection with these hospitals that must strike even the most casual observer is the care, attention, and humane treatment accorded to all who apply for treatment.

Besides the hospitals at all important points, dispensaries for the treatment of out-patients have been established and placed in charge of competent men. District physicians cover certain areas of territory to inspect camps and to minister to those who can not seek prompt medical aid. A hospital car makes daily trips over the road to gather up those who are in need of hospital treatment.

While Panama and the stations along the line show such great changes, Colon does not at a glance show very much improvement over conditions as they existed a year ago. This, however, is not owing to lack of effort on part of the sanitary department. The town is most unfortunately situated for sanitary purposes, and therefore presents difficulties which time and a large expenditure of money alone can overcome.

The placing of Colon on a proper basis for good sanitation has always been regarded as an engineering proposition, and until some definite plan had been adopted and carried out the sanitary department could only direct its efforts toward ameliorating the conditions existing. The forces employed and the character of the work done has been very similar to that done in Panama, but under greater difficulties, there being absolutely no drainage in Colon. The chief work of the health officer of Colon during the past year consisted in combating an outbreak of yellow fever, and this was successfully done.

The installation of a sewerage system is now contemplated, which, necessary as it is, will delay the work of sanitation.

The new water system for Colon contemplates a plentiful supply of water for Colon and Cristobal. A reservoir formed by depression in the hills behind Colon, and fed by a number of small streams in the rainy season, it is calculated will store up about 400,000,000 gallons of potable water for use during both dry and rainy seasons.

The sewerage system of Colon will consist of mains discharging into a central well, from which the sewage will be conveyed by a large centrifugal pump into the back bay, to be carried away eventually by the tide.

A large area of swampy land behind the town has been successfully drained by a shallow canal which has been dug across the island, connecting with which are several lateral canals. Valuable sites for building purposes have been reclaimed by these canals.

By far the most important feature of the work of sanitation on the Isthmus has been that of "mosquito engineering," and it is here that the greatest obstacles have been encountered and also the most gratifying results shown. While the extermination of the anopheles and culex appears to be a hopeless task, a great deal has been accomplished out on the line by the clearing away of vegetation, the draining of swampy areas, and the oiling of standing water around and in the neighborhood of the habitations of the employees and laborers. But the extermination of the stegomyia to an appreciable and practical extent has been clearly demonstrated. Breeding places of this genus can be and are

being definitely located and destroyed, and each month shows a diminution in their number. The improvements above referred to, now under way in Colon, will greatly aid in this work by eliminating the many tanks, barrels, cesspools, and other favorable breeding places for stegomyia. After the case of yellow fever which occurred on May 22 an area comprising 22 houses was fumigated, and a thorough inspection failed to reveal any breeding places of stegomyia in the vicinity.

The good results of sanitation on the Isthmus are shown in the lowering of the general death rate since the sanitary department began operations. There has been a large increase in the population on the Isthmus during the past year, the figures in the report of the chief sanitary officer for the month of April showing that from January 1 to April 30, 1906, there has been an increase from 68,249 to 80,890. This increase consists chiefly of negro laborers from the West Indies, although it includes also a large number of Americans. During the period from July 1, 1905, to April 30, 1906—which is as far as the reports have been published—there were 2,704 deaths in Panama, Colon, and the Canal Zone. Taking the average of these ten months, i. e., 270, the annual death rate would be 40.5 per thousand. This compares most favorably with the rate of 60 per thousand which obtained two years ago. Under the conditions that formerly existed here such an influx of people as there has been would have been followed by terrible results. The death rate among the foreign whites is relatively small, the largest number of deaths occurring among the native and negro population, especially in the cities of Panama and Colon. According to the figures of the sanitary department, the death rate among the negro employees of the Canal Commission and the Panama Railroad is 30 per thousand per year against 14.64 per thousand among the white employees during April.

The average constant sick rate among the canal employees is estimated at about 20 per thousand—that is, there is about that proportion constantly sick in hospital.

The prevailing diseases and the principal causes of death are malaria, pneumonia, dysentery, tuberculosis, and beriberi. Ankylostomiasis prevails to some extent. Yellow fever can no longer be said to be prevalent. Of the 2,704 deaths occurring during the period above mentioned, 1,340 were from the diseases just enumerated, in the following proportion:

	Per cent.
Malaria	507, or 18.8
Pneumonia	347, or 12.8
Tuberculosis	184, or 6.8
Dysentery	120, or 4.4
Beriberi	121, or 4.4
Yellow fever	32, or 1.1
Ankylostomiasis	27, or 1.0
Total	1,340, or 49.3.

Thus one-half of the deaths on the Isthmus are due not only to tropical, but to other preventable diseases also.

Malaria, it will be seen, is the most prolific cause of death, and is attributable to conditions which will always obtain in a tropical climate, with its heavy annual rainfall and the obstacles in the way of exterminating the anopheles mosquito. However, a great deal can and undoubtedly will be done in lowering the percentage of deaths from this disease by prompt rational treatment and by the prophylactic use of quinine. To the latter and to the proper precautions in the use of the screen and the mosquito bar the native population have yet to be educated.

Pneumonia has been increasing since the steady influx of negroes from the West Indies began. These people seem to be peculiarly susceptible to this disease, as they are to tuberculosis, and most of the cases admitted to the hospital are among that class who do not seek prompt medical attention and who live under conditions of wretched personal hygiene. Particular attention is paid to this disease at the necropsies made in the various hospitals.

Dysentery has not proved so fatal as the foregoing diseases. The records of Ancon and Colon hospitals show 335 cases treated in those institutions during the ten months under consideration, including both amœbic and bacillary forms. Besides these, a large number of cases were treated in the hospitals and dispensaries on the line and in the cities of Colon and Panama. The rate of mortality has been comparatively small.

Beriberi.—A study of the official records shows that the deaths from beriberi occurred chiefly in the city of Panama among the native population. The diagnosis in many of these cases is apparently a mistaken one, as cases of ankylostomiasis have been seen among the natives that had been looked upon and treated as beriberi. Ankylostomiasis is largely prevalent among a certain class of the natives of the country, and it is either overlooked or called by some other name, such as beriberi, the anæmia and the dropsical condition leading to this diagnosis. Before the arrival of the American sanitarians ankylostomiasis was not recognized on the Isthmus.

Yellow fever.—That the infection of yellow fever existed on the Isthmus when the present sanitary department assumed charge there can be no doubt. The first case was officially reported on July 12, 1904, from which date there was a steady increase in the number of cases up to June, 1905, when the maximum number of 61 cases and 17 deaths for the month were reported. From July, 1905, the decline was rapid until December, 1905, during which month but a single case was reported.

The résumé of cases for the entire period from July 1, 1904, to December 31, 1905, is as follows:

Date.	Cases.	Deaths.	Date.	Cases.	Deaths.
1904.			1905.		
July	2	1	May	33	8
September	1	1	June	61	18
October	1	0	July	42	13
November	2	0	August	27	10
December	7	1	September	7	4
			October	3	2
1905.			November	3	3
January	18	7	December	1	0
February	14	9			
March	12	4	Total	243	84
April	9	3			

The beginning of the decline is coincident with the time when the sanitary department was allowed a freer hand, enabling it to increase its force with which to thoroughly fumigate the cities of Panama and Colon. As soon as all the houses in the two cities had been fumigated and all premises had been thoroughly searched for breeding places of Stegomyia, the disease began to decline, and from that time definite foci could be located and destroyed.

It might well be asked why this result was not arrived at sooner, but the many difficulties encountered by the sanitary department in its earliest efforts—the restrictions placed upon it, the lack and poor character of the labor, the opposition of individuals, the public skepticism, and other factors—can only be understood and appreciated by those who were on the field at the time.

One more case of yellow fever was reported on May 22, 1906, the source of which has never been satisfactorily explained. However, if the infection exists anywhere on the Isthmus to-day it is not known, and in the present imperfect knowledge of the etiology of the disease and the difficulty in making a correct diagnosis in mild cases it would be impossible positively to assert or deny its presence.

Bubonic plague.—In connection with this disease reference need only be made to the case which occurred at the port of La Boca, the present Pacific terminal of the canal, in June, 1905, and the case said to be plague which was reported in August, 1905. The able manner in which the situation at the time was met with by the chief quarantine officer has been made the subject of former reports. However, it must not be lost sight of that the port of Panama is continually being menaced by the presence of this disease in certain ports on the west coast of South America, with which there is constant communication. An effective quarantine is being maintained against those ports, and the steamships plying between suspected ports and Panama are now supplied with the Clayton sulphur furnace, with which they can effectively be fumigated to destroy rats. The inspection of these vessels by officers of the Public Health and Marine-Hospital Service at Guayaquil and Callao is an additional safeguard against the introduction of the infection into Panama.

Quarantine service.—The maritime quarantine service of the Isthmian Canal Commission has been efficient and has been ably managed. This service, as all the other services, has its peculiar difficulties. The port of Panama, though well

adapted for it, has never had a proper modern quarantine station, and the harbor of Colon is so situated that no suitable site can be found for such a station. A passenger quarantine against Costa Rican, Colombian, and Venezuelan ports and against Bocas del Toro is being maintained. An officer of the sanitary department of the Isthmian Canal Commission has been stationed at Bocas del Toro to assume the duties of health officer of that place and to place the town in a better sanitary condition, especially as regards yellow fever.

MEXICO.

During the close quarantine season of 1905 and the close quarantine season of 1906 to June 30 medical officers were detailed in the offices of the United States consuls in the following ports of Mexico: Progreso, J. F. Harrison; Tampico, John Frick (season of 1905); Veracruz, R. L. Wilson (season of 1905), John Frick (season of 1906, April 6 to June 30).

The duties of these officers were to inspect vessels bound for the United States or its possessions; if necessary, to disinfect the same for the destruction of mosquitoes; inspect the personnel, and sign the bills of health. Their transactions do not call for special comment.

SOUTH AMERICA.

Medical officers of the Service have been detailed in the offices of the American consuls at Callao, Guayaquil, and Rio Janeiro. Their services at Callao and Guayaquil were necessary on account of the yellow fever and bubonic plague, to protect not only the continental United States, but also the Canal Zone.

As the sanitary conditions in these South American ports affect so positively the health administration of American cities, the reports of these officers are of particular interest and importance, the more so since through the international conferences of American States and the holding of international sanitary conventions the matter of international obligations with regard to contagious diseases is one attracting wide attention. In the near future it is evident that these matters will be the subject of definite propositions between the American Republics.

The reports which follow illustrate clearly the interdependence of the several Republics in the prevention of the introduction and the suppression of contagious diseases.

GUAYAQUIL, ECUADOR.

Passed Asst. Surg. B. J. Lloyd reports for the fiscal year ended June 30, 1906, in part as follows:

Number of bills of health issued	102
Number of vessels fumigated to kill vermin	77
Number of vessels fumigated to kill mosquitoes	3
Number of pieces of baggage authorized for shipment	2,418
Number of vessels infected with yellow fever while in port (bound for American ports)	3

NOTE.—These vessels did not observe the anchorage approved by this office, and were fumigated before departure.

Number of immune certificates issued	310
Number of persons vaccinated	165

Maritime quarantine.—Five days' quarantine is enforced by the Ecuadorean Government against persons arriving from plague-infected ports, counting from the day the vessel left the last infected port. Vessels from such ports are fumigated to kill vermin regardless of the time consumed on the voyage or of conditions aboard. Baggage of persons detained is given a superficial disinfection with sulphur gas, or if the vessel is provided with a steam chamber such articles as are not damaged thereby are disinfected by steam.

Yellow fever.—Official reports for the twelve months ended June 30, 1906, give 371 deaths. The largest number of deaths for any one month (April) was 58, and the smallest (August) 2 deaths. The death rate is estimated at about 20 per cent, which would indicate a total of 1,850 cases for the year. Many deaths are entered in the official reports as due to "fever," and it is probable that the number of cases and deaths is considerably in excess of what has been given. Various interior towns present cases from time to time, among them Naranjito and Bucay. The organization known as the "Beneficencia" maintains a lazaretto, which is fairly well screened, in which such patients as so desire are treated. By far the majority of cases are treated in private residences and no precautions are taken. No effort is made to destroy mosquitoes.

Smallpox is commonly present in Guayaquil and throughout the Republic. During the past year there were 227 deaths from this disease in Guayaquil, the largest number for any one month being 26, and the smallest, 6 deaths. No effort is made to isolate cases and vaccination is not rigidly enforced.

The wet season just past is said to have been the most remarkable for many years with regard to increased mortality and morbidity. The annual death rate for the month of March rose to 118 per thousand and the morbidity was correspondingly high.

Vessels clearing for the Canal Zone are required to anchor outside the zone of infection. All vessels arriving from plague-infected ports are fumigated to kill vermin before being given a bill of health. Steerage passengers and crew embarking in Guayaquil, on vessels requiring an American bill of health, are vaccinated.

Recently the statement has been made that plague had made its appearance in Guayaquil in the year 1904, and this statement was even accepted in official circles. On calling the attention of the Junta Superior de Sanidad to the publication of this report it was promptly denied. I believe the absence of plague is due to the fact that vessels which call at Guayaquil are kept fairly free from vermin by fumigation and perhaps, in some measure, to the fact that vessels do not dock in Guayaquil. It is certain that about the time that fumigation was begun on the coast there were several vessels that presented an epizootic among the rats aboard, and in the beginning rats were killed in large numbers. At present the rats are almost completely driven out of the holds, but some find lodging in other parts of the vessel. While the number of rats has greatly diminished, the system of partial fumigation, which seems the only one capable of adoption at present, permits a certain number of rats to escape. Faulty construction (speaking from a sanitary standpoint), materially hampers the work of extermination of rats on board. As an example of what is meant by this, many passenger steamers are constructed with double walls for ceilings, dining room, saloon, etc., and rats almost invariably cut their way through these walls and inhabit the interspaces. I believe that the relation of shipping to the spread of plague and the extent of the disease at the present time constitute so great and continued a menace to human life and commercial interests that laws should be enacted looking to a correction of the present errors of construction.

A very cheap and valuable measure which could be easily enforced in yellow fever ports against mosquitoes would be to require vessels calling at such ports to be provided with movable wire screens for the doors and windows of staterooms, saloon, dining room, etc. (in addition to the usual precautions).

The Government of Ecuador has ratified the action of its representative to the sanitary conference (Washington, 1905) by adopting the measures agreed upon.

CALLAO, PERU.

Asst. Surg. William M. Wightman reports for the period from April 17 to June 30, 1906, in part, as follows:

During this period there were dispatched for Ancon, Canal Zone, and for ports in the United States 18 vessels, of which 16 were fumigated prior to

departure. Fumigation was done with sulphur by the Clayton apparatus, and included holds, crews' quarters, and storerooms, also steerage quarters on ships which contained them. There were inspected 1,239 members of crews, 761 cabin and 462 steerage passengers, and their effects were inspected and passed or disinfected. Certificates of health were issued to 289 persons, 14 were vaccinated, and 1 received a certificate of immunity to smallpox.

There were 2 cases of yellow fever on vessels entering this port and 1 death from plague, diagnosed by the ship's surgeon. These cases all occurred while en route south from Ancon and Guayaquil. There were no cases on vessels bound toward Ancon.

Progress of epidemics.—At the beginning of the calendar year the following localities in Peru had cases of plague, viz: Lima, Callao, Paita, Trujillo, Guadeloupe, San Pedro, Mollendo, Chiclayo, Moche, and Nueva Chosica. Monsefu and Lambayeque became infected in February, Eten, Reque, and Pisco in March, and Pacasmayo in April.

Excepting Lima and the district of Trujillo, the number of cases in all these localities was comparatively small, no one place, with the exception of the two just named, ever having more than 6 cases existing simultaneously.

The disease has apparently never spread more than a few miles from the coast, the 2 cases reported from Nueva Chosica, about 40 miles from Lima, being probably the farthest inland.

At the time of my arrival in April the epidemic in Trujillo was commencing to decline, while that in Lima was at its height, 31 cases occurring in that month, an average of slightly over 1 new case a day. In May it began to decline in Lima, only 11 cases developing that month, of which 9 occurred in the first two weeks and only 2 in the latter half of the month. A case occurred on the 6th of June, and on the 30th another was reported in the public press as having been taken to the lazaretto.

In the rest of Peru the disease has also steadily decreased. There are only 7 cases officially reported as existing in the country, of which 4 are in Paita, 2 in Trujillo, and 1 in Lambayeque.

As no case has developed in Callao since March 26, the Peruvian sanitary authorities suspended outgoing quarantine on June 21.

They have been working very hard to control the epidemic, supervising shipping and at certain times also railroad trains, removing all cases to lazarettos and fumigating the houses for disinfection and destruction of vermin; also fumigating places where dead rodents were found, whether such rodents proved to be surely plague infected or not. And this work continues.

Of other diseases not a great deal is to be said. Smallpox is nonexistent in Lima, and there has been but one case in Callao since April. Malaria is endemic in certain localities, and enteric fever here and in Lima. Leprosy occurs rarely in the interior, and the peculiarly Peruvian disease, veruga, in the districts of San Bartolome and Huaraz. Tropical dysentery also occurs, but is not very common.

The greatest enemy of mankind here, as elsewhere, is tuberculosis, and that in spite of the excellent climate enjoyed by this part of Peru. The great mortality from this disease is to a considerable extent due to the largely indoor life habitually led by the population and the poor construction of their houses, which are generally built in a manner to exclude every possible ray of sunlight.

It should be noted that the stegomyia mosquito is very common in this part of Peru, so that the ingress of a case of yellow fever might possibly lead to very serious consequences.

RIO DE JANEIRO, BRAZIL.

In his report for the fiscal year ended June 30, 1906, Acting Asst. Surg. W. J. S. Stewart has stated that during the fiscal year 163 vessels departed for the United States, for Cuban ports or Canal Zone ports, requiring inspection by the Service representative. Doctor Stewart continues his report, in part, as follows:

IMPROVED SANITARY CONDITIONS IN RIO.

If as good regulations were in force in the Amazon region, in Pernambuco and Bahia, and Rio Grande do Sul as have been enforced in this capital during the past two and a half years, good results would have followed. This city up

to that time was one of the most badly infected cities, as regards yellow fever, in the world, not even yielding the palm to Habana. The past epidemics, of the true numbers of which, and the fatalities occurring during them, no one will ever know, as no correct records were kept at the time, were something almost unbelievable. Now, since the changes in the city, the resewering, the proper disposal of garbage, the diligent search after mosquito-breeding possibilities, the drainage of all low places, the oiling of places which can not be at the time drained, and the other precautions against yellow fever taught sanitarians by the discovery of the method of transmission of the disease, all these matters and attention to them and their causes have reduced the morbidity and mortality from this cause in Rio to a very low standard. The city is as unlike what it was five years ago in regard to these matters as could be possible. And, unfortunately, all the authority for these great improvements was vested in an empirical law, a law to be put into force for a period of three years and the result watched, and then if the result was for the public good the law was to be made statutory. The question will come up in the next year. If the law, with amendments shown to be necessary by the past two years' experience, be not made a statute, then there will occur a relapse into old conditions.

In the last two years and nine months, the period during which I have been detailed here, conditions as regards health—general health—have very much improved. The change in the outward appearance of the city even shows wonderful improvement. The sanitary work is most encouraging, the work of this department being excellent in every way indeed, leaving little to be desired. Some years ago all the work of excavation, etc., in the city would have produced an epidemic without doubt; now the city has never been healthier, nor has the work of the Port Works Company, dredging out a channel all along the upper bay front, building a sea wall, and filling in behind it, interfered in the least with the health of the city, as so many people predicted would be the case. The mud dredged up is carried out to sea in specially contrived lighters—steam, of course—and dumped well outside the mouth of the harbor, and the refilling is done either with clean sand taken from a bar in the lower part of the bay or else with the débris from the many houses destroyed in widening the streets and in making the Avenida.

Rigid inspection and disinfection of all vessels arriving from infected Brazilian or foreign cities has been maintained for two years with very excellent results. Two specially built disinfecting barges do this work.

Total number of persons inspected at Rio during fiscal year 1906.

Total number of crews of vessels inspected	5,209
Total number of first-class passengers from Rio	316
Total number of steerage passengers from Rio	453
Total number of first-class passengers in transit	137
Total number of steerage passengers in transit	454
Total inspected	6,569

WEST INDIES.

Barbados and St. Lucia.

Following the procedure of the foregoing year, during the fiscal year ended June 30, 1906, medical officers were detailed in the offices of the American consuls at Bridgeton, Barbados, and Castries, St. Lucia, during the periods of close quarantine. By the disinfection at those ports of vessels from infected Central and South American ports quarantine detention of said vessels on arrival at southern ports of the United States was avoided. In addition to disinfecting and giving bills of health to vessels Asst. Surg. W. K. Ward at Bridgeton, by request of the Isthmian Canal Commission, made physical examinations of laborers for the Canal Zone. From July 1 to September 22, 1905, at which latter date the representative of the Isthmian Canal Commission departed from Bridgeton for Panama,

the total number examined was 2,121, of whom 325 were rejected for physical causes.

During the close quarantine season of 1906 the medical officer at Bridgeton was Acting Asst. Surg. R. H. Urquhart. At Castries, during the close quarantine season of 1905, the medical officer was Passed Asst. Surg. L. D. Fricks, and for the close quarantine season of 1906, Acting Asst. Surg. John O. Rush.

CUBA.

Medical officers throughout the fiscal year have been on duty at the principal ports of Cuba, exercising supervision over vessels and passengers leaving for the United States and signing the bills of health with the American consuls. Much valuable information has been obtained from these officers as to sanitary conditions in Cuba. A portion of this information is included in the abstracts of their reports, which follow.

HABANA.

Passed Asst. Surg. R. H. von Ezdorf reports for the fiscal year ended June 30, 1906, in part as follows:

The following changes in personnel of the station occurred during the year: Surg. C. P. Wertenbaker was in command at the beginning of the fiscal year until relieved from duty August 1, 1905; Acting Asst. Surg. J. M. Delgado in temporary charge from August 1 until November 17, 1905; Passed Asst. Surg. R. H. von Ezdorf assumed charge on November 17, 1905; Asst. Surg. M. C. Guthrie reported for duty May 18, 1906; Acting Asst. Surg. J. M. Delgado on leave from May 14, 1906, and transferred to New York June 27, 1906.

One clerk and one sanitary guard comprise the only other assistance in the office. The increased amount of work during the extended close quarantine season and a modified quarantine throughout the winter has rather strained this small force for efficient and expeditious work.

The office is located on the second floor of the passenger building, on the water front, and is gratuitously furnished by the Cuban authorities. This office has been occupied by the Service ever since its first occupancy during the days of the American occupation of Cuba.

A gasoline launch rented by the Service is used for boarding purposes.

Bills of health.—The operations of the Service at this port are guided strictly by the quarantine regulations for foreign ports and, in a measure, those for domestic ports, where by its observance the vessel can avoid a quarantine detention at the port of destination.

Vessels sailing direct for a port in the United States are inspected on the day of sailing before bill of health is issued. In case of vessels sailing via Cuban or other foreign ports the bill of health is issued in the office after ascertaining by inquiry from the ship's master or agent that the sanitary condition of vessel and crew is in all respects satisfactory.

Outgoing quarantine.—Special regulations with regard to vessels, passengers, and crews sailing for southern ports in the United States were enforced throughout the year, beginning November 13, 1905.

These regulations can best be given and explained under dates when instructions from the Bureau were received.

Close quarantine.—On November 13, 1905, the order was received from the Bureau that the close quarantine season had been extended with regard to vessels from Habana. This was due to the announcement of the presence of yellow fever in Habana on November 10, 1905.

The regulations embodied in paragraph 13 for foreign ports and 108 for the domestic ports were enforced with the exception that crews of vessels were not required to be immune to yellow fever. Accordingly only immune passengers were allowed to embark for southern ports.

Vessels sailing for southern ports were fumigated with sulphur dioxide, 2 per cent. for three hours, while the vessel was lying in open bay. This fumi-

gation was done only if the vessel had at any time during its stay in this harbor been alongside of a wharf. Vessels which had remained in open bay were not fumigated. This work continued throughout the year.

For the fumigation of vessels the materials required—sulphur, alcohol, pots, and pans—were furnished by the vessels and the work supervised by the office.

On December 9 an order was received from the Bureau removing immunity requirement for passenger travel for all southern ports excepting Florida, and on December 26 the immunity requirement was further removed, effective for all southern ports. Thereafter a careful inspection of passengers was made, and for this purpose every passenger leaving for southern ports was required to present himself at the office, where, after a visual examination and the taking of temperatures when believed necessary to corroborate other symptoms, a health certificate was issued, giving name, age, sex, nativity, and temperature, and stating that the individual presented no evidence of a quarantinable disease. The temperature of all second-class passengers was taken and recorded, Cubans excepted. A number of persons were not permitted to embark owing to an elevated temperature, and it is known that one such case developed dengue, for which he was treated at Las Animas Hospital.

The tourist travel to Cuba was large while it lasted, and large parties arrived soon after the removal of restrictions to passenger travel on December 26, 1905.

Early after the first order of December 9 the Munson steamship line contemplated an excursion for 200 teachers for December 23, 1905. In reply to an inquiry from the Bureau as to the advisability of checking this, the opinion was expressed that there would be a minimum risk if the excursionists did not quarter in or visit private residences and limited their visit to sight-seeing and shopping on main thoroughfares.

This advice was also given to other excursionists, who were rather apprehensive of the sanitary conditions in Habana, particularly with regard to the risk of contracting yellow fever.

The close quarantine season against all suspected or infected ports was again declared on March 15, 1905, but this was not to be applied to Habana unless infection was evident by the development of a case in the island.

Beginning with April 1, 1906, the temperature of all passengers leaving for southern ports was taken and recorded on the health certificate issued. No one was allowed to embark without such certificates.

Quarantine against all ports in Cuba was declared on May 19, 1906, upon the report of a case of yellow fever at a plantation near Union de Reyes, province of Matanzas. Accordingly, since that date all regulations for close quarantine have been enforced.

On June 27, 1906, the Southern Pacific steamship line commenced operating their vessels between this port and New Orleans, consuming six days on the voyage. By this means nonimmune passenger travel was opened for this southern port, the passenger undergoing the period of detention en route. All such passengers embarking are examined and their temperature taken and noted on the health certificate issued.

Yellow fever in Habana.—On November 10, 1905, the superior board of health of Cuba reported the first case of yellow fever. Subsequent investigation by the board of health proved that 2 cases had occurred during October, which had been diagnosed—1 malignant jaundice and 1 nephritis. The dates of invasion of the disease for these two cases are given as October 17 and October 23, 1905. A short epidemic followed the announcement of fever. From October 17, 1905, to February 11, 1906, 72 cases with 23 deaths were reported in Habana. The infection of 4 more cases with 3 deaths was traced to Habana. This would give a total of 76 cases with 26 deaths for Habana, a rate of mortality of 34.2 per cent.

The following is a summary of cases and deaths reported:

	Reported.	Deaths.
October 17 to 23	2	2
November 1 to 30	29	7
December 1 to 31	35	11
January 1 to 31	4	3
February 1 to 11	2	.....
	72	23
Infected in Habana	4	3
Total	76	26

There were, besides this, 8 cases of yellow fever which originated in seven different places in the interior of the island. These cases were reported from Marianao, San Jose de las Lajas, Banaguises, Alacranes, Real Campiña (2), Matanzas, and Bolondron.

Another prevailing disease during the summer and autumn of 1905 was dengue fever. The mortality statistics for the period from September to December, 1905, inclusive, give 7 deaths from that disease.

The Cuban quarantine service.—No changes in the personnel of officers of the local quarantine service were made.

Throughout the year a quarantine is maintained against Mexican, Central and South American ports. A quarantine was also declared against Gulf ports of the United States upon the appearance of yellow fever in New Orleans on July 22, 1905, which was maintained until December 9, 1905.

The modus operandi of such quarantine is the following:

Vessels arriving from a quarantined port are brought to anchor in open bay. The quarantine flag flies at the foremast at all times, and no one is permitted ashore except the captain in the transaction of official business. The cargo is discharged and taken on by immune stevedores only.

In the case of passenger vessels, a sanitary guard is detailed to remain on board day and night. Only immune passengers are allowed to land, and all other passengers disembarking for this port are placed in Triscornia detention camp for five days, the time being counted from the moment of disembarking. The temperatures of all nonimmunes desiring to disembark are taken, the nonimmune in transit being simply inspected.

Sailing vessels are fumigated and held five days before being allowed alongside of a wharf.

This practice differs from the methods pursued at the quarantine stations in the United States, where, during close quarantine, all vessels are first fumigated and held five days before being allowed to proceed with the discharge of its cargo, unless operating under special regulations.

This is probably due to the nature of the harbors in Cuba, the supposition being that a Stegomyia mosquito, even should it be infected, could not fly the distance ashore.

Sanitation in Habana.—During the present year sanitary measures especially directed toward the eradication of lurking yellow-fever infection were pursued. For this purpose also a special appropriation of $200,000 was made by the Government to carry on the work throughout the island. Of this appropriation about $76,000 was for Habana.

Plans for a sewer system in Habana have long since been made, but the work is yet to be begun. This important and much-needed work for the general sanitation of Habana finds delay for want of appropriation.

Mortality statistics for Habana.

Date.	Number of deaths.	Date.	Number of deaths.
1905.		1906.	
June	556	January	552
July	496	February	458
August	457	March	475
September	511	April	505
October	496	May	550
November	445	June	531
December	450		
		Total	6,482

Estimated population, 300,000.
Annual rate mortality, 21.60 per 1,000.

Beginning with March, 1906, the sanitary condition of the port was reported as suspicious until the development of a case of yellow fever in May, when it was again reported as infected.

A summary report of transactions at Habana for the year ended June 30, 1906, follows:

Bills of health issued	1,344
Vessels fumigated	229
Crews	56,755
Passengers	36,796
Health certificates issued	13,337
Immune certificates issued	576
Certificates of vaccination issued for Colon, Panama	214
Pieces of baggage inspected	470

Cordial relations have been maintained with the Cuban authorities.

MATANZAS.

Acting Asst. Surg. E. F. Nunez reports, for the fiscal year ended June 30, 1906, in part as follows:

The office has been since February 1, 1905, at 23 Nicolas Heredia street, where it was moved as per Department approval dated January 23, 1905.

There has been no change in the personnel of the station during the past year.

In consequence of the outbreak of yellow fever in Habana during the month of October, 1905, and before any sanitary precautions had been taken to prevent the importation of the disease into the city, one case of yellow fever was reported on November 26, which arrived during the period of incubation and was detected on the fourth day of its invasion. Although the case occurred at a centrally located section of the town, in the vicinity of many nonimmune residents, yet such were the sanitary measures carried out at the time to prevent the dissemination of the contagion that the disease was successfully stamped out and no developments have been reported since then within the city limits.

On December 7, one case of yellow fever ending in death was reported at a plantation colony belonging to the Valiente sugar estate, within 2 miles from the rural town of Union de Reyes, and about 30 miles distant from Matanzas.

On December 11 and 13, 2 new cases of yellow fever were reported at the town of Colon. The first case was detected at the rural town of Real Campiña, a place located within the municipal district of Cienfuegos, and close to the boundary line between the provinces of Santa Clara and Matanzas. This case was taken to the hospital of Colon, being the nearest, for its isolation and treatment, and died December 14. The second case reported at Colon was brought there from the Alava sugar estate, near the town of Banaguises, and about 9 miles north of Colon. This case recovered.

On December 14 and 21, 2 additional cases of yellow fever were reported at the Valiente plantation, in Union de Reyes; both cases recovered.

On February 5, 1906, 1 case of yellow fever ending in death was reported at a plantation colony known by the name of Atrevido, close to the town of Bolondron, and at a distance of about 35 miles from Matanzas. Case died February

4, and was confirmed as yellow fever by post-mortem examination held on the 5th.

On May 18, 1 case reported as yellow fever, confirmed, brought to the hospital of Matanzas from the Olano colony, close to Union de Reyes, but belonging to the municipal district of Bolondron. Case died May 18.

On May 23, 1 case confirmed at Union de Reyes from the same origin, that is, the Olano colony. This case was isolated at the city hall of Union de Reyes, where it recovered.

Total number of cases reported during the year, 8, with 4 deaths.

The most striking features to be noted in connection with these cases of yellow fever are: (1) That they all occurred in Spanish immigrants after a short residence in Cuba; (2) that the infection in almost every instance was directly traceable to Habana; (3) that the cause of the dissemination of the disease outside of Habana was evidently due to the nonobservance of proper sanitary precautions with the immigrants on being released from the detention station at Trisconia. They were allowed to enter Habana and expose themselves to the contagion without subjecting them to observation during the known period of incubation of the disease prior to their leaving for different parts of the island. It will be remembered that during the prevalence of yellow fever in Habana in 1900, the military governor of the island, General Wood, established the observation station of Trisconia on the recommendation of Surg. A. H. Glennan, then chief quarantine officer of Cuba, with the main object of preventing immigrants from entering Habana. They were there detained until employment was secured, and released only on board of a vessel or a train about to leave for various parts of Cuba, being under sanitary supervision up to the time of departure. These restrictions were enforced and properly carried out at the time, and no instance is known where such immigrants ever conveyed elsewhere the infection prevailing at the time in the Cuban capital; (4) that the fact that every case reported in Matanzas occurred in Spanish immigrants of recent arrival, as also the majority of those reported in Habana, tends to indicate a greater susceptibility of these Europeans to contract the disease during their acclimation period than any other class of foreigners; (5) that it is a remarkable coincidence, almost incredible to note, that notwithstanding the nonrestriction on travel from Habana to all points in the island, which may be reached, generally speaking, within the incubation period of the disease, no cases of yellow fever have so far been reported beyond the provinces of Habana and Matanzas; yet the same current of immigration more or less has been going on from Habana to every part of the island since the beginning of the present outbreak in October last. Is it that the rest of the island has ceased to be a favorable medium for the development of the disease?

No vessel entered the harbor during the past year with any quarantinable disease on board.

Cuba has maintained quarantine throughout the year against Mexico, the Central American Republics, Colombia, and Venezuela. In addition to this, the same sanitary measures were observed against Gulf ports from the commencement of the recent epidemic of yellow fever at New Orleans up to December 9; subsequently, on May 25, quarantine was again decreed against the States of Louisiana, Mississippi, Alabama, and Texas—Florida being excepted. In view of the presence of yellow fever at La Vega, Santo Domingo, reported by the American minister to that Republic, as wired by the Bureau under date of June 14 last, quarantine was established since then against that island and Haiti by the Cuban authorities.

In accordance with Bureau cablegram dated May 19, 1906, directing the enforcement of quarantine regulations on ships, and immunity requirements as to passengers going to any port south of the southern boundary of Maryland, and all Gulf ports, every ship leaving the harbor since then for any of the above-mentioned places direct has been carefully fumigated under direction and supervision, and the condition of passengers, crews, cargo, and baggage ascertained from personal inspection immediately before sailing.

A reorganization of the sanitary department of the city has been accomplished and a new force devoted to a house-to-house inspection has been added to it since the month of November last. The department now disposes of sufficient personnel and funds, appropriated and controlled by the State, for the proper cleaning and sanitation of the city, and since then a decided improvement is being observed. No sanitary organization exists in any country

town within the province, and their cleaning and sanitation is only carried out in emergency cases, as when an epidemic disease prevails. In the recent outbreak of yellow fever in these rural districts a sanitary brigade was ordered from Habana in order to meet this sanitary requirement temporarily.

Summary of the transactions for the fiscal year ended June 30, 1906:

Bills of health issued	281
Passengers inspected	597
Crews	7,990
Stowaways	2
Vessels fumigated	15
Health and acclimation certificates issued	11
Certificates of vaccination	4
Pieces of baggage inspected and passed	4

There were no transactions for the Canal Zone nor for the Republic of Panama during the past year.

The following cases and deaths of communicable diseases in town, including those of yellow fever within the province, were officially reported to the office for the fiscal year just ended:

	Cases.	Deaths.		Cases.	Deaths.
Yellow fever	8	4	Enteric fever	26	9
Leprosy	1	0	Measles	2	1
Scarlet fever	56	2	Dysentery	1	1
Diphtheria	39	6			

The aggregate number of deaths from all causes within the city limits for the fiscal year just ended was 835, showing an increase by 129 as compared with that of the corresponding period in 1905, and giving an average of mortality of 17.40 per mille.

SANTIAGO.

Acting Asst. Surg. Richard Wilson reports for the fiscal year ended June 30, 1906, in part as follows:

The work of the office has consisted principally in issuing bills of health to vessels bound for the United States and its dependencies, to inspect them when it was necesary, and to attend sick sailors on American vessels. A few vessels were fumigated.

During the year 261 bills of health were issued. This is an increase of 28 over the last fiscal year. During the last two years the numbers of bills of health issued has increased, but it is still below the year 1902–3.

As usual, the greatest number of bills of health were issued during the winter months, when the sugar crop was being made, and the smallest during the summer months, when the fields are being cultivated.

The Cuban steamship *Julia*, which makes regular monthly trips between Habana and San Juan, P. R., has been fumigated at every outward trip but one since December, 1905, at the request of the vessel's agents, to kill mosquitoes, to avoid quarantine at San Juan.

This was the only vessel fumigated until the telegram of May 19, 1906, "Enforce until further notice precautions paragraph 13, Quarantine Regulations, and immunity requirements as to passengers in paragraph 108, letter C."

As the result of this, two more vessels were fumigated—the steamship *Albis*, on June 4, and the steamship *Salvador*, on June 12. The total number of vessels fumigated during the fiscal year was 8; none of them had sickness on board.

There were a few American seamen needing medical assistance. The mild cases were treated in their quarters; the severe cases were sent to the civil hospital, at the vessel's expense.

In compliance with the telegram of May 19 above referred to, 21 immune certificates were issued during June.

Only four vaccination certificates were issued for the Canal Zone and Panama.

HAWAII.

Passed Asst. Surg. L. E. Cofer, chief quarantine officer of the Hawaiian Islands, has submitted a report embodying transactions at Honolulu and six subports in the islands. The following is extracted from his report:

HONOLULU.

Division of outgoing quarantine.

On account of the presence of bubonic plague in Honolulu outgoing quarantine restrictions were begun on October 30, 1905, and discontinued December 28, 1905. On May 16, 1906, the outgoing quarantine restrictions were resumed and continued through June 30, 1906.

Transactions.

Vessels inspected and bills of health issued	80
Vessels disinfected and bills of health issued	51
Cabin passengers inspected	752
Steerage passengers inspected	3,198
Crew inspected	1,027
Pieces of steerage baggage disinfected	4,363
Pieces of baggage for crew disinfected	1,229
Hides disinfected	3,113
Pieces of freight disinfected	33
Number declined certificates on account of fever	79

Division of quarantine station proper.

Orientals detained in quarantine for observation	943
Europeans detained in quarantine for observation	372
Pieces of baggage disinfected	1,984
Number of days the station has been in quarantine	58
Number of persons vaccinated	130
Number of patients treated in hospital with quarantinable diseases	4

Incoming transactions at Honolulu national quarantine station for year ending June 30, 1906.

Month.	Steam vessels inspected.			Sailing vessels inspected.			Vessels disinfected.	
	Number.	Crew.	Passengers.	Number.	Crew.	Passengers.	Steam.	Sailing.
July	22	3,000	4,807	16	243	61	0	0
August	16	2,711	1,789	14	237	36	1	0
September	19	2,495	4,328	9	143	20	0	0
October	20	2,734	5,167	18	309	19	0	0
November	19	3,273	6,293	11	185	26	0	0
December	22	3,416	5,783	15	287	11	0	0
January	20	2,961	4,687	9	162	9	0	0
February	27	4,005	5,884	13	177	9	0	0
March	24	3,313	6,034	15	264	18	0	0
April	12	3,758	4,653	9	259	9	0	0
May	24	3,207	5,357	18	351	18	0	0
June	20	3,021	4,258	21	382	22	0	0
Total	245	37,894	59,040	168	2,999	258	1	0

Transactions at subports during the fiscal year.—Hilo, 40 vessels inspected; Mahukona, 17 vessels; Kahului, 13 vessels; Lahaina, 6 vessels; Koloa, 1 vessel, and Kihei, 1 vessel.

PORTO RICO.

Passed Asst. Surg. M. H. Foster, chief quarantine officer of Porto Rico, stationed at San Juan, reports for the fiscal year ended June 30, 1906, in part as follows:

Six hundred and nineteen steamers and other vessels inspected and passed; 137 were held in quarantine, and 12 were disinfected. Four hundred and sixty-eight nonimmune passengers coming from yellow-fever ports were held in quarantine under observation for a period of five days. A detailed report is submitted from each of the seven subports of the island, viz: Mayaguez, Arecibo, Humacao, Aguadilla, Arroyo, Fajardo, and Ponce.

The chief aim of the quarantine on this possession is to keep out yellow fever. During the year 6 cases of sickness of more or less suspicious nature were taken to the quarantine hospital and held under observation to make a diagnosis. No vessel with quarantinable disease aboard arrived at the station during the year. Many vessels from ports infected with yellow fever were permitted to transact their absolutely necessary business in quarantine under guard without any delay or disinfection procedures whatever. As this is simply a port of call for several large steamship lines, this procedure is absolutely necessary if they are to be permitted to do business here at all.

During the year no yellow fever has appeared on the island, hence there has been no outgoing quarantine. During the outbreak of yellow fever in Louisiana a strict quarantine was maintained against all vessels from New Orleans.

INDIA.

CALCUTTA.

Acting Asst. Surg. Olin M. Eakins reports for the fiscal year ended June 30, 1906, that the details of action with regard to vessels and crews clearing for the United States were essentially the same as those which were employed last year and embodied in last year's annual report. Bills of health were issued to 51 vessels, carrying 9 passengers and 2,837 crew.

CHINA.

HONGKONG.

Passed Asst. Surg. M. J. White reports, in part, as follows:

During the fiscal year ended June 30, 1906, the station's work in the interest of the public health of the United States, the insular territories, and the Republic of Panama was performed as expeditiously and effectually as practicable under the conditions obtaining. The scope of the work was, first, "To prevent the spread of epidemic diseases;" and, second, to detect "loathsome and dangerous contagious diseases" among aliens desiring to embark for the United States and foreign ports beyond. In respect to preventing the spread of epidemic diseases, efforts were directed not only against the quarantinable diseases (par. 1, Quarantine Regulations), but also against the diseases contemplated in paragraphs 29 and 67. In these measures the provisions of paragraph 5 were duly observed as much as practicable. There are no facilities for enforcing the detention of passengers and crews as provided in paragraphs 30 to 37, inclusive, and, owing to the short stay of vessels in port, the enterprising spirit of competitive commerce, the "ways of the Asiatic," and the expense of maintaining the requisite facilities, it is altogether likely that such detention can never be enforced. The only feasible régime, therefore, has been to require forecastle crews and steerage passengers to bathe and undergo special examination and to disinfect with steam or formalin their personal luggage. Further precautionary measures were fumigation of vessels to kill rats and insects, supervision of ship's supplies and cargo. Cargo considered by regulations as likely to become infected was disallowed aboard until certified as safe by this office. The safety of cargo was determined by adequate investigation, disinfection, and storage detention (par. 22.)

Official return of "communicable diseases."

	Cases.	Deaths.	Europeans.	Asiatics.
Plague	972	907	7	965
Smallpox	194	134	13	181
Cholera	6	6	1	5
Enteric fever	64	20	.....	.....
Diphtheria	5	.....	.....	.....

In respect to the detection of loathsome and dangerous contagious diseases, it has been a rule to examine only those passengers going second class and steerage who were manifested as aliens and sent as such by the steamship companies. If the steamship agents have entered American citizens as aliens and subjected them to examination, it is not the fault of the Service, even though such citizens are manifested as aliens and as having a loathsome or dangerous contagious disease, and thereby indirectly prevent them from obtaining passage. The agents have several times been cautioned in regard to this serious error.

Formerly Chinese coming from the interior would apply for examination some days before sailing, saying that if they were afflicted they would avoid further living expenses in Hongkong by returning at once to their homes. In order to accommodate them many were examined, but it was found out that in all probability their friend—interpreters, who were usually affiliated with Chinese passenger-brokers—undertook to obtain money from them on the ground that it would enable them to pass the required examination. Most of those rejected for trachoma sought treatment from local practitioners, and they accordingly blamed the Service for causing them the attendant expenses. It was therefore decided to post a notice to this effect in the steamship offices, on the disinfecting hulk, and in the Service office, and also to give them to those rejected. But on account of the chronicity of trachoma and the freedom from subjective symptoms, the Chinese deny that they have any eye disease, and certainly not sufficient to prevent their return to America.

Facilities for enforcing the precautionary measures.—Personnel: One passed assistant surgeon, 1 acting assistant surgeon, 1 clerk, and 1 office cooly.

The Service office is in the same building with the American consulate-general (No. 2 Pedder street), and it is suitable.

The fumigation and disinfection bureau is adequately equipped for disinfection and fumigation of baggage and vessels, according to Service regulations.

Assistance rendered the consular service.—Persons applying to the consul-general for extension of their papers have been examined to determine any existing diseases that would prevent their reentrance to the States and also to determine whether their claims of inability to return within the time limit allowed by their papers were true. Malingering in this latter respect is not infrequent, as the Chinaman does not always care to return to the States "within one year."

Duty in Hongkong is very enervating, owing to the exasperating humidity and heat.

The relations with the consul-general and his staff have been highly satisfactory and agreeable.

Statistics of work.

Steam vessels granted bills of health	384
Sailing vessels granted bills of health	5
Vessels fumigated to kill vermin	10
Persons examined for diseases contemplated in paragraphs 29 and 67 of the Quarantine Regulations:	
Personnel	25,676
Passengers	5,240
Rejections for quarantinable diseases	6
Persons examined for diseases contemplated by the laws controlling immigration:	
Aliens (second class and steerage)	3,844
Rejected	965

Baggage:		
Pieces inspected and labeled		257
Pieces disinfected and labeled		28,118
Cargo stored in godowns (paragraph 22):		
Bristles	boxes	615
Human hair	do	170
Feathers	bales	202
Cargo disinfected—Hides	do	276

(For report on inspection of aliens at Hongkong, see "Medical Inspection of Immigrants.")

SHANGHAI.

Acting Asst. Surg. S. A. Ransom reports for the fiscal year ended June 30, 1906, in part as follows:

The disinfection carried on here is, as stated in previous reports, done under the immediate supervision of the Service office. Passengers' baggage is usually treated with formalin-saturated sawdust, it being the only method available, while vessels and the effects of crews are generally subjected to sulphur dioxide generated by the pot method, 6 pounds of roll sulphur being used for each 1,000 cubic feet of space. It was hoped that before this time facilities for steam disinfection of effects and the bathing of such individuals as seemed to require it would be available, but such is not the case. A disinfection hulk has been constructed, but the machinery is defective. There is no fault to be found with the chamber or the bathing arrangements, but the boiler capacity is too small. It is said that this will be remedied within the month and the plant placed in operation. Any disinfection done with this floating plant will, of course, so far as this Service is concerned, be carried on under personal supervision of the Service officer.

Steamers plying between this port and the United States and Manila are still required to prevent the landing of any crew or steerage passengers while here, and on vessels lying at wharves the use of rat guards is insisted upon as far as practicable.

Vaccination is recommended to all vessels bound direct to American ports or to Manila during the prevalence of smallpox, and this recommendation has been acted favorably upon in a large majority of cases. Where ballast is required by such vessels, stone is invariably recommended. One vessel which failed to adopt this suggestion and carried mud has never been heard from since her departure from Shanghai.

There has been no friction during the year with the shipping interests.

Every effort has been made to maintain accurate knowledge, through the consular officials, of the sanitary conditions existing at the different outports shipping goods through Shanghai to the United States. A fair amount of success has attended this effort.

Certain classes of cargo coming from these outports, viz, hides, personal effects, human hair, etc., are required to be accompanied by a consular certificate showing that they have been properly disinfected before the shipping order or manifest is countersigned.

The following is a tabulation of the communicable diseases reported in the settlement during the year just closed:

	Cases.	Deaths.
Smallpox	9	23
Enteric fever	93	10
Diptheria	27	58
Scarlet fever	11	4
Tuberculosis	12	1,235

It may be mentioned in this connection that the "cases" were all Europeans, while the "deaths" were all Chinese. It is estimated that about 75 per cent of cases of communicable disease occurring among Europeans are reported, while from 10 to 15 per cent of deaths from such diseases are reported among the Chinese. The natives are disposed to conceal deaths from cholera and smallpox,

on account of the trouble caused them when such diseases are reported. The statistics obtainable here as to morbidity and mortality are not very reliable, due largely to lack of support in this direction by the local physicians. The total mortality reported for the year was 101 Europeans and 5,595 Chinese, with an estimated population of 12,000 and 475,000.

No cholera was reported last year, but the disease was present, as there were several European cases and at least three deaths.

Plague still menaces Shanghai, as the disease prevails at ports north and south of Shanghai, and in some cases within two days of the port by steamer. This disease, however, seems not to have effected an entry.

Summary of transactions.—Vessels spoken and passed, 9; steamers inspected and passed, 131; steamers disinfected, 4; sailing vessels inspected and passed, 19; sailing vessels disinfected, 9; number of crew on steamers, 17,790; number of crew on sailng vessels, 276; number of passengers on steamers, 8,073; number of passengers on sailing vessels, 19; bills of health issued, 158; pieces of freight viséd, 644,196; pieces of freight inspected, 83; pieces of freight disinfected, 5; pieces of baggage inspected, 394; pieces of baggage disinfected, 1,154; vaccination certificates issued, 868; cases of illness investigated, 50.

(For report on aliens inspected at Shanghai, see "Medical Inspection of Immigrants.")

JAPAN.

YOKOHAMA.

Passed Asst. Surg. Hugh S. Cumming reports for the fiscal year ended June 30, 1906, in part as follows:

Steam vessels inspected and granted bills of health, 236; sailing vessels inspected and granted bills of health, 19; war vessels granted bills of health upon certificate of their medical officers—American, 7; British, 1; total 8. Cabin passengers upon vessels actually inspected, 5,732; steerage passengers upon vessels actually inspected, 18,886; crews upon vessels actually inspected, 25,557. Persons required to bathe and undergo special inspection, 9,830; pieces of baggage disinfected and labeled, 14,879; aliens (would-be steerage passengers) examined for the United States Immigration Service to determine their freedom from loathsome or dangerous contagious disease, insanity, etc., 26,760; passed as free from such diseases, etc., 10,134. Vessels required to be fumigated under supervision of this office before being granted clean bills of health, 14.

In addition to this, quantities of freight are personally inspected and disinfected, detained for inquiry or certified, and all manifests of freight are examined and viséed.

By courtesy of Dr. K. Rokkaku, the port physician, the following statistics of infectious diseases in the Empire of Japan are available for the period of twelve months ended December 31, 1905:

	Cases.	Deaths.
Dysentery	37,973	8,599
Enteric fever	22,831	5,272
Smallpox	278	62
Typhus fever	2	2
Scarlet fever	127	11
Diphtheria	13,230	3,876
Plague	[a] 271	[a] 208
Taiwan (Formosa):		
Plague	2,398	2,098

[a] Only in Hiogo-ken (Kobe) and Osaka-fu.

There are said to be about 70,000 lepers in the country.

Owing to its proximity to endemic centers of plague and more especially to the large importations of rice and cotton from India, the country is repeatedly reinfected with plague despite a very efficient maritime quarantine. The first cases in Tokyo and several subsequent outbreaks in Kobe and the great manufacturing center, Osaka, have been traced to such importations. Recognizing this danger, it is stated the Government will follow the example of this Government in the law of 1893, and will station medical officers at strategic sanitary ports from which cargoes are shipped to Japan.

While the sanitary condition of the city is, as stated, satisfactory, there continues to be danger from Tokyo, where, despite the splendid work of the municipal authorities, plague rats are still found, as well as from persons and cargo from infected inland centers.

KOBE.

Acting Asst. Surg. D. Ross Kilpatrick reports, for the fiscal year ended June 30, 1906, in part as follows:

There were officially inspected 245 vessels bound for ports in the United States and ports in the possession of the United States. Of the above, 240 were steamships and 5 were sailing ships. Of these, 71 were under the United States flag, 105 British, 29 German, 28 Japanese, 7 French, 3 Norwegian, and 2 Austrian.

The ports of destination were as follows: Manila, 67; San Francisco, 56; New York, 43; Honolulu, 39; Seattle, 35; Tacoma, 28; Portland, 20, Puget Sound, 3; Cebu, P. I., 1.

The crews of these vessels amounted to 25,679. One hundred and five steamers carried 8,223 steerage passengers.

Four war ships received bills of health during the year.

Steerage passengers embarked at Kobe for—Honolulu, 2,457 Japanese, 7 Koreans; San Francisco, 156 Japanese, 3 Koreans, 13 Europeans; Seattle, 483 Japanese, 8 Europeans; Tacoma, 116 Japanese, 1 European; Manila, 53 Japanese, 1 Filipino; Mexico, 128 Japanese.

Total aliens for United States	3,426
Japanese for Canada	562
Total	3,988
Through steerage passengers	4,235
Grand total	8,223

The number of steerage passengers, 8,223, added to the crews, 25,679, gives a total of 33,902 examined by us during the period of twelve months.

The number of pieces of baggage disinfected at this port was 3,876.

During the two periods that the port was infected with plague Asiatic steerage passengers were kept isolated for a period of seven days, while other regulations with regard to plague laid down in Quarantine Laws and Regulations of the United States were stringently enforced.

Twenty vessels had their holds and crews' quarters disinfected with sulphur, crews bathed, and their baggage disinfected by steam.

Two outbreaks of plague have occurred during the last year (see statistics below), the exact causes of which can not be discovered. The first outbreak occurring among employees in a cotton mill in Hiogo, and also in a cotton mill in Osaka, experts were sent to India to ascertain if Bombay cotton was the cause, and their opinion was that the cotton could not be the cause of infection. The cities of Kobe and Osaka were thoroughly cleaned and disinfected, and an extensive crusade against rats came out, with the result of reducing the number of cases of plague. There were 4 cases of cholera during the year, all of whom recovered.

At Kobe-Hiogo, during the past twelve months, there were 146 cases and 108 deaths from plague.

In Osaka there were 156 cases of plague and 130 deaths from the disease.

Kobe and Osaka were declared infected from November 20, 1905, and Kobe alone from May 12, 1906, and is still infected, June 30, 1906.

NAGASAKI.

Sanitary Inspector Robert I. Bowie, M. D., reports that during the fiscal year ended June 30, 1906, 111 steamers and 3 sailing vessels were inspected, carrying 20,959 passengers and 21,345 crew.

PHILIPPINE ISLANDS.

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippines, reports for the fiscal year ended June 30, 1906, in part as follows:

The question above all others which has engaged the best efforts of the Service during almost the entire year has been to prevent the spread of cholera from Manila by sea to other ports and islands in the Philippines and to the United States and its possessions. The amount of time and labor involved in this task can scarcely be adequately set down on paper, nor can the matter be appreciated by those who did not actually take part in the work.

From the the outbreak of cholera in Manila, August 23, 1905, to the close of the fiscal year not a single case of the disease was carried by vessel to any point outside of Manila Bay. Cases were frequently encountered upon vessels during the time they were undergoing their outgoing quarantine detention, but with the facilities of the Mariveles quarantine station available it was always possible to make the disinfection so thorough that no spread from the original case took place.

The large amount of experience which the Service has had with cholera in the Philippines justifies the statement that the incubation period is seldom, if ever, beyond forty-eight hours, and with the exception of the first few weeks of the outbreak the detention placed upon outgoing vessels has, in most instances, not been beyond forty-eight hours.

The great aid that this shortened quarantine period was to the interisland shipping interests will be appreciated when the great business depression under which the islands are now laboring is taken into consideration. But the important point is that not only was it possible to reduce the delay and annoyance to commerce to very small proportions, but also for the first time in the history of outgoing quarantine detention in the Philippines has the same been entirely effective. The fact that the disease was kept from sweeping through the southern islands means the saving of an incalculable number of human lives and many thousands of dollars. In other words, the Service was able to render that aid which is called for in the fulfillment of its highest ideals.

PERSONNEL.

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippine Islands.

Manila.—Passed Asst. Surg. Victor G. Heiser, in command; Passed Asst. Surg. John D. Long, Asst. Surgs. R. E. Ebersole and Herbert M. Manning; Pharmacist and Disbursing Officer N. C. Comfort.

Mariveles.—Passed Asst. Surg. Charles W. Vogel.

Iloilo.—Asst. Surg. R. H. Creel.

Cebu.—Passed Asst. Surg. Carroll Fox, Pharmacist Charles R. McBride.

Zamboanga.—Acting Asst. Surg. H. F. Pipes.

Jolo.—Acting Asst. Surg. Charles B. Ewing.

Cavite.—Acting Asst. Surg. A. R. Alfred.

Olongapo.—Acting Asst. Surg. E. J. Grow.

Seventy-two more persons are employed in the Service, who perform the duties of clerks, disinfectors, vaccinators, crews, attendants, etc. Total personnel, 84.

In the last annual report the fact was mentioned that the present chief quarantine officer had accepted, with the consent of the Bureau, the position of commissioner of public health, with the understanding that the new duties should be in addition to his former ones. On November 1, 1905, the Philippine Commission greatly increased the duties of the commissioner of public health, combining with it the management of the civil hospital, the sanitation and medical service of Bilibid Prison and other prisons throughout the islands, and also the Benguet Sanitarium was placed under the direction of the bureau of health. At the same time the Commission changed the title from commissioner of public health to director of health for the Philippine Islands.

MANILA OFFICE.

At the time the general reorganization of the Philippine government was being undertaken last October it was proposed to make the quarantine service a division of the bureau of health; in fact, the bill had already passed two readings before the Commission. The plan, however, was deemed very undesirable, in that it took away much of the independent character of the Service, and much of its prestige would have been lost in dealing, particularly, with foreign countries. Upon full explanation being made to the Commission, the plan was abandoned, and the Service in the Philippines still occupies the position of an independent bureau under the insular government.

CHOLERA IN THE PHILIPPINES.

From March 8, 1904, until August 23, 1905, no cases of cholera are known to have occurred in the Philippines. From time to time during this latter period suspicious cases, which clinically resembled Asiatic cholera, came to the attention of the insular board of health, but the diagnoses could not be confirmed bacteriologically. For the two weeks immediately preceding August 23 the number of suspicious cases increased. In Manila one occurred in San Pedro Macati, a suburb of Manila; one in a bakery in Paco; one in the San Miguel district; one case was that of a soldier in the Cuartel de España, and several others occurred in the province of Rizal. The cases in Manila were all carefully autopsied and the intestinal contents bacteriologically examined by such competent observers as Dr. R. P. Strong, of the government laboratory, and his assistants; and the case of the soldier was carefully investigated by the military medical authorities and specimens examined at the army laboratory which is maintained in connection with the First Reserve Hospital in Manila. From both of these independent sources the results were reported as negative.

On August 23, while Passed Asst. Surg. John D. Long, of this Service, was making autopsies at Bilibid Prison, he found a case which presented a typical pathological picture of cholera. The bacteriological examination which was made later at the government laboratory revealed the cholera spirillum of Koch. Thus occurred the first officially recognized case of cholera of the present outbreak—a case in an institution which is practically cut off from the remainder of the world, where all foodstuffs are permitted to enter only after the most rigid inspection, and where all food served that would be likely to convey cholera is cooked at all times. As a precaution against dysentery it is said that all drinking water was sterilized; therefore it would seem that the routine precautions taken at the prison should have afforded protection against cholera. The commencement of an outbreak in this insidious manner was most puzzling to the sanitary authorities, and the prospects of combating a disease whose origin was so obscure were not encouraging. On the following day six cases, suspicious of cholera, were reported by Major Wales, from Fort William McKinley, which is located about 7 miles up the Pasig River from Manila. For the week preceding August 23 about 8 cases had occurred at the fort. The symptoms were the same as those usually found in vino poisoning, which is so common among the United States soldiers in the islands, and in the absence of any cholera being reported anywhere in the Philippines there was no particular reason for investigating the cases further. In view of the fact, however, that the diagnoses of some of the later cases that occurred at the fort were bacteriologically confirmed, the earlier diagnosis of vino poisoning may not have been correct. The military medical men at once commenced active measures, and the comparatively few days that cholera persisted at the fort is another excellent example of how readily the disease can be eradicated when sanitary principles are intelligently applied.

On August 25 an American woman residing at the Grand Hotel in the walled city was attacked and died in a few hours. On the same day an American man residing on San Sebastian street, in a section of the city nearly 2 miles from the previous case, was seized and died a few hours afterwards. No connection could be traced between the two cases, nor could any history be obtained that the same articles of food which would be likely to convey the infection had been eaten by these two victims.

The characteristic tendency of the outbreak continued during the early weeks of the scourge, namely, no connection could be traced between the cases. No two cases occurred in any one house, nor did two cases occur in any one group

of houses. A study of a map prepared showing the order in which cholera cases occurred in the city of Manila shows clearly that succeeding cases apparently had no connection with one another. In almost every instance they occurred in widely separated sections of the city.

In the meantime a telegram received August 26 from Jalajala, province of Rizal, through the army medical department, contained the following information:

"Cases of a disease resembling cholera have developed in Jalajala, the first case being registered on the 21st. From the date to the 25th 16 cases and 12 deaths have been registered, the illness lasting from twelve to twenty-four hours."

On August 26 another telegram, received from the president of the provincial board of health at Pasig, reported one suspicious case, followed by death, in that town. A representative from the insular board of health and another from the bureau of government laboratories proceeded at once by special launch to Pasig and Jalajala for the purpose of making an investigation as to the cause of the outbreak in those places. The result of this investigation did not shed any light upon the origin of the infection. Inquiry made by the inspectors only resulted in showing that at least one week prior to August 23 more deaths had occurred in Jalajala than usual and that the victims had profuse diarrhea and died a few hours after the symptoms manifested themselves.

An investigation made by Dr. L. T. Hess, captain and assistant surgeon, U. S. Army, of the records on file at Muntinlupa and Binan, situated at Rizal and Laguna provinces, respectively, and on the opposite shore of Lake Laguna from Jalajala, showed that a number of death certificates had been filed during the week preceding, the cause of death being given as suspicious diarrhea.

In the following table is given the death rate per thousand in Manila for the years 1903 and 1904, in which no cholera was reported. The death rate for the same months in 1905, during which 250 deaths from cholera are reported, is also given.

Month.	1903.		1904.		1905.	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
August	862	46.17	1,032	55.28	841	45.03
September	1,228	67.97	1,064	58.89	1,013	56.06
October	1,217	65.19	1,018	54.53	850	45.51
November	974	53.91	957	52.97	944	52.24
December	894	47.89	794	42.53	841	45.03
Total	.....	281.13	.....	284.20	.....	243.87
Average	.....	56.22	.....	56.80	.....	48.77

From the above table it will be seen that the death rate for the years in which no cholera was reported was actually higher by more than 8 per thousand than in 1905, when cholera was reported.

The above showing is particularly important in view of the fact that an increase in the mortality has been almost universally accepted as being a strong factor in indicating that deaths from communicable diseases are occurring. Many epidemiologists who have written upon this subject in the past have laid special stress on the fact that where it was difficult to obtain the actual cause of death that an increase in the number of deaths should be regarded with suspicion.

It will now be interesting to consider whether the infection was introduced into the Philippines from without or, in other words, from foreign countries, or whether it was merely a recrudescence of the disease known to have been present during 1902 and 1903. In order to discuss this subject intelligently it will be necessary to ascertain in what near-by foreign countries cholera was present at the time of the outbreak in the Philippines. Manila is in active communication by direct steamship lines with the following oriental ports: Yokohama, Kobe, Nagasaki, Moji, Shanghai, Amoy, Hongkong, Saigon, Singapore, Rangoon, Calcutta, Madras, Bombay, and, indirectly, with Sourabaya and a few other Javanese and Bornean ports. Examination of the official sanitary statistics received from the ports mentioned discloses the fact that cholera was present in an isolated manner in the country to the back of Kobe, Japan, in

Calcutta, and in Bombay. In the case of the two latter ports, the sailing time to Manila by the most direct steamers is at least nine or ten days from Calcutta and at least fifteen days from Bombay. In view of the fact that the incubation period is only five days and that no sick were found on any of these vessels in the two months preceding the outbreak and that from laboratory experience it has been ascertained that vegetables and other cargo which come from these ports will not serve as media for the growth of the cholera bacilli for a greater period than five days, it is shown that for practical purposes these two ports may be dismissed from further consideration. At any rate, the only importations from India are rice, onions, potatoes, textiles, ivory goods, and other articles not at all likely to convey cholera organisms.

No cholera was reported from Hongkong and none was known to exist at Canton, but in view of the fact that the actual status of the public health in Canton is not well known at any time, that place can not be excluded with any degree of positiveness. The time from Canton to Manila by way of Hongkong would require at least from four to five days, but in view of the fact that only onions, potatoes, garlic, and such other vegetables were shipped from these ports, which are necessarily forwarded in a dry state, it is not likely that the cholera organism could have been introduced with them. Furthermore, no sick were found on any of the vessels which entered the Philippines from Hongkong, so that it is reasonable to exclude that port from the list of places likely to have been the cause of the introduction of the infection.

The records show that from Kobe a number of vegetables were shipped, but they consisted principally of onions and potatoes, and a very small amount of cabbage. The vessels that arrived from that port for the month preceding the outbreak of cholera in Manila did not have any cases on board which were in any way suspicious of cholera. In view of the fact that cabbage is the only vegetable which could likely have been the cause of the introduction of cholera, and since at least five days is consumed in the voyage, and more time must necessarily have elapsed before it could have been placed on the market, and since experiments made in the laboratory of the Public Health and Marine-Hospital Service show conclusively that cholera organisms can not be kept alive on cabbage for longer than five days, this method of the introduction of the infection may also be excluded. The only other articles which are open to suspicion, imported from Kobe, Japan, are classes of food peculiar to the Japanese and which are not eaten by other nationalities. Many of these consist of vegetables in a fermented state, which in itself precludes the possibility of cholera organisms existing therein, and, furthermore, no Japanese are known to have been attacked in the city of Manila until the disease was present at least five days, and after more than 25 cases had occurred in other nationalities. It is therefore not likely that the infection can be ascribed to Japanese food products.

From the foregoing it will be observed, then, that so far as it is possible to tell from the records it is not likely that the infection gained entrance into the Philippine Islands from without. This is further strengthened by the fact that the first known case occurred in the interior of the Philippines and not at any seaport, and the evidence is clear that the disease spread to Manila from the interior by the ordinary roads of travel. While there is not sufficient evidence to form a positive conclusion, still the facts in our possession at the present time strongly indicate that the infection which was introduced in 1902 has not yet been entirely eradicated. Against the supposition that the disease is endemic in the Philippine Islands is the evidence that while the disease occurred throughout the Philippine Islands in 1902 and 1903, yet during the recent outbreak it has been confined to within a radius of 75 miles of Manila, and if cholera is endemic in the Philippines, as claimed by many, it is difficult to explain the nonappearance of the disease outside of the limits mentioned above.

PLAGUE IN THE PHILIPPINES.

During the year there has been less plague in the islands than at any time since the American occupation, 22 cases and 18 deaths being reported for the year.

During March infected rats were found in a number of sections of the city, being the first time they have been detected for over a year, and an outbreak of plague among human beings was more or less expected from this fact, especially in view of the statements made by Professors Kitasato and Shiga, of Japan, that an outbreak of human plague can almost be predicted to occur

with certainty within a period of sixty days from the time that the first infected rats are found. It is, therefore, very satisfactory to report that so far not a single case of human plague has occurred.

Upon the discovery of plague among rats the most active measures were taken by the bureau of health. A large force of rat catchers was employed, which operated all over the city, the idea being to ascertain the extent of the infection. Radiating lines were drawn from the infected center to the outskirts of the city, and rats caught in all sections of the city covered by the lines in question. It was soon learned that the infection among rats was confined to two centers, one in the district of Binondo, in the large block which is bounded by Calle Rosario and the Escolta, and another small block in the district of San Nicolas, in which much plague has been encountered heretofore. Large numbers of rat catchers were sent into these infected centers, and, so far as possible, all rats were caught and destroyed. A thorough disinfection of this area was then commenced. Work was begun in the topmost story of all buildings. All goods were moved to make sure they harbored no rats, and everything, unless of entirely new nature, was thoroughly disinfected with bichloride solution. This work was continued story by story until the ground floor was reached, after which the entire premises surrounding the buildings were cleaned up. Wood piles were found to be favorite harboring places for rats. These were invariably torn down and replaced upon sites that had previously been made rat proof. All rat runs were destroyed, drains and open spaces connected with the buildings of the infected sections were thoroughly cemented, and other repairs made which seemed to be indicated. The work occupied almost two months' time, but, so far, the results that have been obtained have fully justified the outlay.

The freedom which the Philippines have enjoyed from plague can undoubtedly to a large extent be credited to the work of the Service in preventing the introduction of fresh cases from the nearby foreign countries. This is particularly satisfactory when it is remembered that the number of cases of plague in Hongkong and Canton this year has been much greater than has occurred in previous years. With the excellent inspection service maintained along the China coast by officers of this Service, supplemented by the work which is done on vessels upon their arrival here, it has been possible to keep the plague infection in thorough check. Under the head of "Vessels disinfected," there is given a brief history of the three vessels which arrived in the Philippines with plague aboard.

In conclusion, it may be stated that the experience of the Service in the Philippines shows that the same measures which result in the eradication of rats, mice, and other vermin aboard vessels also prevent the transmission of plague. For this reason it has been deemed advisable, in order to prevent the spread of plague in the Philippines, to continue the fumigation with sulphur of all vessels engaged in the interisland trade, as well as those vessels bound for the United States.

SMALLPOX AND VACCINATION.

Six vessels arrived with smallpox on board; six cases came under observation, all of which were removed from vessels. No secondary cases developed at the quarantine stations among contacts held to complete the incubation period.

The crews of interisland vessels have now been so thoroughly vaccinated that it is very rare to find a case of smallpox upon interisland vessels, and when it is does appear it usually occurs in the person who had only recently accepted appointment and had not yet been successfully vaccinated.

The Service in the islands has vaccinated a grand total of 7,645 persons, Of these, there were 4,661 members of crews vaccinated at Manila, with 2,698 known "takes." At Iloilo there were 695 persons vaccinated, with 342 known "takes." At Cebu there were 1,502 vaccinations, with 635 known "takes." At Manila the proportion of "takes" was over 57 per cent.

The custom of vaccinating all members of crews who apply at the office of the chief quarantine officer, and before they take service on vessels, has been continued throughout the year, and no doubt much of the freedom from smallpox may be attributed to this measure.

LEPROSY IN THE PHILIPPINES.

Four cases of leprosy were detected on vessels during the year. Three vessels were disinfected by officers of the Service on account of their carrying lepers on board. These vessels were engaged in collecting lepers throughout the islands and removing them to the Culion leper colony.

The two cases of leprosy which were sucessfully treated and apparently cured at the San Lazaro Hospital by the use of the X-ray again showed leprosy bacilli in their tissues during the month of March. It is not known whether these cases actually relapsed or whether they were infected at the hospital. Owing to lack of proper isolation facilities, it was impossible to keep them separate from other lepers. The treatment also had to be discontinued before it was considered to be completed, on account of the breakdown of the X-ray apparatus, so that, up to the present time, the treatment of leprosy with the X-ray in the Philippines has not received a proper test under favorable conditions. One of the cases remained free from leprosy bacilli for nearly nine months. It is hoped that before the next annual report a more definite statement can be made upon this manner of treatment.

For the first time in the history of the Philippine Islands definite steps have been taken with regard to the eradication of this disease from the islands. Heretofore from 400 to 600 lepers have been confined in leper institutions at the expense of the government. It was more in the nature of a charity and really accomplished nothing toward stamping out the disease. It is estimated that there are now between 4,000 and 5,000 lepers in the Philippines, and at a low cost of maintenance it is thought that each leper would cost at least 25 cents per day, which would make a fixed charge on the government of $1,000 per day, or something like $365,000 per annum. The revenues of the insular government are unable to support such a large number of persons at the present time. However, in order that something might be done toward eradicating this disease, it has been determined to free as many of the islands as possible from lepers at the present time. Accordingly lepers from the islands of Mindoro, Masbate, Romblon, Siquijor, Oriental and Occidental Negros, Cuyo, and Palawan have now been collected and sent to the new leper colony on the island of Culion. It is proposed to keep these islands entirely free from lepers, and if any should make their appearance in future they will be immediately removed. The insular government has now made appropriation with which 800 lepers may be kept at Culion leper colony, and it is hoped that in a short time the lepers from the islands of Samar and Leyte will be added to those already at Culion, thus rendering a considerable amount of the territory of the Philippine Islands free from lepers.

VESSELS BOARDED.

During the year there were 3,266 incoming vessels boarded at Manila and 3,252 at the other ports of entry of the islands—a total of 6,518. This is a decrease of 101 at Manila and a decrease of 3,278 at the other ports, a total difference of 3,379 in favor of last year. The actual number of incoming vessels, however, is much greater than these numbers indicate, because many interisland vessels are exempted from inspection on arrival, for reasons given in previous annual reports. Incoming vessels are boarded from sunrise to sunset, and at Manila vessels arriving late in the day call at Mariveles for inspection and pratique, and thus add three hours to the actual time vessels are inspected upon arrival, making the inspection practically from sunrise to 9 p. m.

VESSELS DISINFECTED.

Fifty-nine incoming vessels were disinfected during the year. Of this number, 51 were disinfected at the Manila station, 5 at Iloilo, and 3 at Cebu. In addition to the above, there were 31 partial disinfections of vessels. Twenty-three vessels were disinfected on account of quarantinable diseases being found on board upon arrival, and 36 were disinfected on account of coming from infected ports. Six vessels were disinfected on account of cholera occurring on board, 4 for suspected cholera, 4 for leprosy, 6 for smallpox, and 3 for plague.

From the foregoing it will be seen that there has been a decrease in the number of infected vessels. Last year there were 28, as against 23 for this year.

There were 3 very large vessels during the year infected with plague. It it very satisfactory to report that the facilities of the station proved entirely

adequate to meet the demand. The steamship *China*, of the Pacific Mail Steamship Company, arrived at Manila with a case of plague on board in the person of a Chinese member of the crew. By the prompt measures that were taken no further spread occurred, and the cargo which was taken ashore gave rise to no further cases. The second case arrived at Cebu on the British ship *Banca*. The facilities of the new quarantine station were not yet entirely available, so that it was not possible to stamp out the disease with the same promptitude which obtained at Mariveles. In all, a total of two cases occurred, and when it is remembered that all the rats and cats on board were infected, it will be seen that the infection was widespread over the vessel. The last case occurred on the *Kumano Maru*, a Japanese vessel which plies between Japan and Australia and only makes this a port of call. The case occurred in the person of a steerage passenger who was bound for Manila.

VESSELS FUMIGATED.

One hundred and forty-three vessels were fumigated with sulphur for the purpose of killing rats and other vermin. This work takes a great deal of time, labor, and careful official supervision. This work during the year has been performed quite satisfactorily. No claims for damages of any kind have been made, and not one letter of complaint has been received, which, while praiseworthy of the manner in which the work was performed, emphasizes the desirability of conducting this important work under the direct supervision of trained officials.

The number of vessels fumigated has dropped off considerably from the number reported last year. This is not because there were actually less vessels fumigated, but on account of arrangements having been completed at Hongkong whereby many of the vessels are now fumigated at that port under the direction of Passed Asst. Surg. M. J. White instead of in the Philippines, as heretofore.

CARGO.

The same rules and regulations which were mentioned in the last annual report with regard to the importation of cargo remained in force throughout the year, and so far as could be observed no particular hardships were created by their enforcement. Permitting vegetables that are forwarded in a dry state, such as onions, potatoes, and garlic, to come into the Philippines, provided they are accompanied by certificate showing they were not grown in infected districts, has proven satisfactory. The production of vegetables like cabbage, lettuce, green onions, cauliflower, tomatoes, etc., has been so stimulated in the Philippines that the prohibition placed upon their entrance is very little felt at the present time.

OUTGOING QUARANTINE.

The regulation of the outgoing traffic between the Philippines and the United States still requires considerable time in its supervision. Twenty-one army transports, which carried steerage passengers, sailed for the United States during the year, making an average of about 700 persons on each transport who were bathed and disinfected at Mariveles quarantine station. One hundred and thirteen other vessels coming under the provisions of the United States Quarantine Laws and Regulations were granted consular bills of health for United States ports. Twenty of these vessels were held in quarantine five days before sailing. Thirty-one vessels were partially or entirely disinfected, and 8 were fumigated throughout before the bills of health were issued. The crew and passengers of all vessels bound for United States ports were inspected on board prior to sailing.

During the year 31,806 pieces of baggage were disinfected and 30,305 inspected, making a total of 62,111 pieces of baggage, all of which were labeled in accordance with the Regulations. In addition there were certified 256,673 pieces of miscellaneous cargo before the same was loaded on vessels bound for United States ports. The inspecting and certifying of the above-mentioned cargo and baggage entails a vast amount of difficult and annoying office and outside work.

AID TO OTHER SERVICES.

1. Board on marine examinations.—During the year there were 602 physical examinations made of masters, mates, engineers, pilots, and other ships' officers in accord with section 3 of act 780 of the Philippine Commission, which states, among other things, that the candidate for examination or applicant for license must be physically sound. These examinations are rigid and correspond in scope to those made of applicants for the Life-Saving or Revenue-Cutter services in the United States. There were 33 rejected and 38 provisionally passed.

2. Immigration service.—There were inspected 2,860 aliens; 23 were certified for rejection, and all so certified were deported by the immigration officers.

3. Bureau of health.—Vessels in port were disinfected on account of having diseases occur on board, and permits issued for the discharge of special incoming interisland cargo, such as hides, lard, etc.

4. Bureau of education.—Eighty-five cadets of the nautical school (young men being educated at government expense to be officers on vessels) were physically examined; 10 were rejected and 3 passed provisionally.

5. Bureau of navigation.—Officers and sailors were examined to determine their physical fitness for promotion or positions on the coast-guard vessels as officers or cadets. Candidates for the position of light-house keeper were also physically examined; water was furnished the vessels of the coast-guard fleet at Mariveles; cutters or launches were fumigated or disinfected when necessary.

6. Coast and geodetic survey.—One physical examination was made at the request of this bureau, and one officer was examined in order to determine his physical fitness for promotion. A board of Service officers was convened for the purpose of making recommendation as to the advisability of one of the coast and geodetic officers being transferred to the United States on account of his health.

7. Bureau of posts.—One employee was physically examined prior to promotion, at the request of the director of posts. The postal authorities were granted every facility and furnished an enormous amount of labor during the outgoing quarantine for the dispatch of the mails. A clerk from the Manila post-office was detailed for duty as an attaché of the Mariveles station to superintend the distribution of the arriving mail to the vessels in quarantine. As many as 200 sacks were handled in one day.

8. Bureau of civil service.—Special physical examinations were made, at the request of the director of civil service, of candidates whose physical status was doubtful. Ten per cent of those examined were rejected. Examination papers were also examined and marked whenever requested.

9. Panama Canal Zone.—Cargo, baggage, and household goods bound for the Zone were inspected and passed or disinfected and certificates with regard to same issued.

FLOATING EQUIPMENT.

The vessels of the Service, four launches and two disinfecting barges, have been in commission all year and have been kept in a high state of efficiency. The launches have been operated very successfully, and considerable hard service has been required of them.

No serious damage was suffered by any of the vessels of the Service during the many severe typhoons of the past year.

Owing to the completion of the quarantine station at Cebu, the floating disinfecting barge *Proteccion* was removed from Cebu to Iloilo. The disinfecting barge at Iloilo is now in bad condition and requires a general overhauling, and it was intended to remove it to Manila in order to have this done, but the early onset of the typhoon season made it impossible to accomplish this, and the same will now have to wait until the end of the calendar year before it can be safely done. It is the intention to use the disinfecting barge *Esmeralda*, which has heretofore been at Iloilo, at Manila. In this way the business of the public can be much expedited, because many small parcels which require to be disinfected will not have to be sent to Mariveles, which is over 30 miles from Manila.

INTERISLAND QUARANTINE.

Owing to the appearance of cholera in Manila, it has not been possible to dispense with the interisland quarantine at Manila, but the number of vessels inspected at outports at the present time has been gradually decreased, so that the hindrance to commerce at the present time amounts to but very little. As soon as the conditions in Manila warrant it is proposed to make further reductions in the number of vessels that will require inspection upon arrival. No bills of health are required by interisland vessels at any port except Manila, and it is hoped when the cholera conditions improve that this requirement can also again be dispensed with.

LABORATORY OF THE SERVICE AT MANILA.

The laboratory was of great assistance during the year in properly carrying out the quarantine work and also as an aid in conducting the 700 physical examinations of officers, students, seamen, and others which were made by the officers of the Service. Work in the laboratory was performed by all the Service officers stationed in Manila. The amount of laboratory material is very great, but the routine quarantine work to be done is so large and the officers so few that no large operations or continuous work requiring constant attention was attempted during the year.

Summary of quarantine transactions, both incoming and outgoing, for the Philippine Islands, fiscal year ended June 30, 1906.

	Manila.	All other stations.
Vessels inspected	5,608	4,251
Vessels detained in quarantine	1,397	6
Vessels disinfected	76	9
Vessels fumigated to kill vermin	86	45
Bills of health issued	2,935	237
Pieces of baggage disinfected	44,117	339
Pieces of baggage inspected and passed	30,607	.....
Pieces of miscellaneous cargo certified	256,673	89,900
Cases of quarantinable diseases detected on vessels:		
Cholera	6	.....
Suspected cholera	2	2
Plague	2	2
Leprosy	3	1
Smallpox	3	3
Persons detained in quarantine	78,878	352
Crew inspected	231,271	90,072
Passengers inspected	149,652	31,159
Persons vaccinated	5,948	2,197
Persons bathed and effects disinfected	20,068	456

Quarantinable diseases in Manila, fiscal year 1906.

Smallpox:	
Cases	32
Deaths	5
Cholera:	
Cases	355
Deaths	320
Plague:	
Cases	22
Deaths	22

ILOILO.

Vessels inspected, 1,311; held in quarantine, 4; disinfected, 6; fumigated to kill vermin, 12; bills of health issued, 86; pieces of baggage disinfected, 354; inspected and passed, 62; crew inspected, 30,969; passengers inspected, 14,606; persons held in quarantine, 227; persons bathed and effects disinfected, 331; crew and passengers vaccinated, 695.

CEBU.

Vessels inspected, 1,825; held in quarantine, 2; disinfected, 3; fumigated to kill vermin, 33; bills of health issued, 89; pieces of baggage disinfected, 339; crew inspected, 44,495; passengers inspected, 14,783; persons held in quarantine, 125; persons bathed and effects disinfected, 125; crew and passengers vaccinated, 1,502.

Description of station.—On March 1, the station having been practically completed and ready for work, it was formally opened. It is built on a small island which borders on the channel forming the south entrance to Cebu Harbor. It being an island, a mile away from the nearest land, it is well adapted for quarantine purposes.

The station comprises a medical officer's quarters, cabin passenger barracks, steerage barracks, attendants' quarters, bath house, disinfecting building, three small isolation hospitals, storehouse, wharf, windmill, artesian well, running water, and a sewerage system. It is also the intention to add one more small isolated storehouse for paints and oils.

The disinfecting building is furnished with a 40-horse power return-tube horizontal boiler and a 16-foot disinfecting cylinder with formalin attachment, two cars and necessary tracks, and an autoclave.

The bath house is divided into two parts, one for men, with an undressing room, fourteen showers, a dressing room and water-closet. The other part contains a water-closet and three sets of compartments, each one composed of a little dressing room, shower bath, and an undressing room.

At the face of the dock, which is 50 feet wide, there are 18 feet of water at mean low tide. The gangway of this dock is carried on to the shore between the disinfecting building and bath house.

The cabin passenger barracks contains eight bedrooms, a dining room, a kitchen, and two bathrooms with modern conveniences, one for men and one for women. The kitchen is a separate building, connected with the house. There is an 8-foot porch on the front and sides of the barracks.

The steerage barracks has 86 bunks in the main dormitory, 9 bunks in a small dormitory intended for women, a dining room, a kitchen, three different compartments containing shower baths, stationary washstands, and water-closets, and an 8-foot porch on two sides of the house.

The medical officer's quarters comprises a dining room, living room in front of the house, two bedrooms, a pantry and bathroom in the rear of the house, and a kitchen in a separate building. There is a porch running around three sides of the house. The floors of this house are made of hard wood, red narra, molave, and guijo; otherwise the construction is similar to the other buildings, which are built of Oregon pine frame and floor, suale sides, and galvanized-iron roof.

There is a sewer running from each house to a central cesspool which communicates with the sea and is flushed by the rise and fall of the tide.

The question of securing a good water supply was one which caused a great deal of concern, but was finally settled when the artesian-well machine had driven a distance of 270 feet, when an abundant supply of water was discovered. This water is quite salty, but can be used for drinking and boiler purposes. It presents several interesting features. Observations were made at the last full-moon spring tides and it was found then that at extreme low water the water in the well stood 6.03 feet higher than sea level, while at extreme high water the water in the well stood 4.51 feet above the sea level. As the rise of the tide was 7.2 feet, this means that there was a rise of water in the well of 5.5 feet—that is, the water in the well is always higher than the sea level, rising with the tide and flowing over the top of the pipe at the estimated rate of 25 or 30 gallons a minute. It is very clear that the pressure in the well is greater than the pressure of the sea water outside, and that, therefore, the salt in the well water can not be due to a leak from the sea into the water-bearing stratum. The salt must be already in that stratum, and is being dissolved out by the fresh water. Material taken from the bottom of this well looks very much like beach gravel and sand, and may be an old sea bed covered over with an impervious stratum of clay. The fact that the water in the well rises and falls with the tide indicates that the water-bearing stratum passes close to the bottom of the bay and is, therefore, influenced by the increase of pressure due to the rise of the tide. Hand pumping with an ordinary force pump will not lower the level of the water in this well.

The island is flat, the average elevation above mean low water being about 7.07 feet, This means that with a rise of tide of 6 feet the surface of the island is only 1.07 feet above sea level. The soil is practically nothing but sand. For these reasons one can secure plenty of soil water, which is half sea water, by digging a superficial well 5 feet in depth. It is intended to utilize these superficial wells in connection with hand force pumps for combating fire. On account of the sandy soil it is impossible to dig a hole which will not fill up with sand in a very short time by the caving in of the sides. It is therefore necessary, in order to prevent this, to build some kind of a bulkhead. After getting down 4 feet, it is really like digging out the bottom of the sea.

There are at present about 200 cocoanut trees on the island, several other varieties of scrub trees, and a coarse grass. The soil water being so superficial and salty, and the sand containing so much salt, it is impossible to grow anything except the few hardy trees and plants which are at present on the island. It is the intention, as soon as young cocoanut trees can be bought at a reasonable figure, to plant some on parts of the island which at present are not shaded at all. This is especially necessary in and around a wire-fence inclosure intended for pitching tents, and which is at present exposed to the direct rays of the tropical sun.

The station is at present ready to do any kind of quarantine work that it may be called upon to do, and it is undoubtedly, on a small scale, one of the most modern and best-equipped quarantine stations in the world.

CAVITE.

Vessels inspected, 35; bills of health issued, 31; number of crew inspected, 9,823; passengers inspected, 28.

At Cavite and Olongapo are located the United States naval stations in the Philippines. At these ports inspection stations, under the direction of the Service, are maintained. The officers in charge are surgeons of the United States Navy detailed as quarantine officers by the chief medical officer of the Asiatic Fleet. In quarantine matters they are under the control of the chief quarantine officer.

Vessels of the Navy of all kinds arrive at the Cavite and Olongapo naval stations direct from foreign ports, and are inspected and treated in accordance with the Regulations. No infected vessels arrived during the year. Ships in port having quarantinable or other diseases occur on board were remanded to Mariveles for disinfection. The battle ship *Ohio* had a case of smallpox occur on board, and was remanded from Cavite to the Mariveles station, where the vessel was fumigated and disinfected.

Thirty-three vessels arrived from foreign ports during the year.

ZAMBOANGA.

Vessels inspected, 55; number of crew inspected, 3,064; passengers inspected, 1,508.

The quarantine inspection of vessels arriving at the port of Zamboanga is conducted by an acting assistant surgeon of this Service. An inspection service only is maintained. The Service during the entire year up to May 31, 1906, was in charge of Acting Asst. Surg. M. A. W. Shockley. He was succeeded on June 1, 1906, by Acting Asst. Surg. Henry F. Pipes.

During the year 31 vessels which arrived at Zamboanga direct from foreign ports were inspected. In addition, owing to the presence of cholera in Manila, all vessels from Manila were inspected upon arrival. No quarantinable diseases were detected upon arriving vessels during the year.

Immigrants to the number of 136 arrived at the port during the year and were inspected in accordance with the immigration laws. No diseases requiring certification were detected.

Zamboanga is the headquarters of the department of Mindanao of the United States Army, and the city and vicinity are practically under the supervision of the army officials.

The sanitary condition of the city and neighborhood continues good.

JOLO.

Vessels inspected, 25; number of crew inspected, 1,721; passengers inspected, 334.

At the entry port of Jolo, which is the principal port of the Sulu group of islands, the Service maintains an inspection station only.

From July 1, 1905, to November 5, 1905, the station was under the command of Acting Asst. Surg. William F. Lewis. From November 6, 1905, until January 3, 1906, Acting Asst. Surg. Craig R. Snyder acted as quarantine officer of the port. On January 4, 1906, the command of the Service was assumed by Acting Asst. Surg. Charles B. Ewing, who is in charge at close of the year.

Twenty-five vessels direct from foreign ports arrived at Jolo during the year. No quarantinable diseases were detected upon arriving vessels. The arriving immigrants were inspected. Out of the 37 immigrants bound for Jolo none were found to be afflicted with diseases which call for certification by the immigration laws.

The sanitary condition of the city of Jolo and the surrounding territory as regards quarantinable diseases has remained very satisfactory during the entire year.

EXPENDITURES BY STATION.

MANILA.

General service expenses	$14,558.865	
Launch expenses	6,678.75	
New station equipment	306.975	
		$21,544.59

MARIVELES.

General service expenses and supplies	15,808.55	
Repairs to buildings and wharves	3,657.92	
New construction and equipment	1,452.945	
		20,919.415

ILOILO.

General service expenses	3,673.285	
Launch and barge expenses	3,673.105	
New station equipment	74.465	
		7,420.855

CEBU.

General service expenses	4,650.915	
Launch and barge expenses	3,688.94	
Repairs, buildings, and reservation	633.125	
New construction and station equipment	7,867.18	
		16,840.16

JOLO.

General service expenses	260.00

ZAMBOANGA.

General service expenses	320.00
Total expenditures	67,305.02

NAPLES, ITALY.

For a report of the quarantine transactions at Naples, Italy, during the fiscal year, see report of Passed Asst. Surg. Allan J. McLaughlin, under head of "Medical inspection of immigrants."

MEASURES AT FOREIGN PORTS ON ACCOUNT OF CHOLERA IN EUROPE.

In view of the reports of Asiatic cholera in Prussia and the appearance of a case at Hamburg, taken in connection with the existence of the disease in various parts of Russia in Europe, Passed Asst. Surg. A. J. McLaughlin, who was stationed at Naples, Italy, was directed on September 1, 1905, to proceed as quickly as possible to Hamburg to confer with the American consul-general at that point, and, if necessary, to enforce Treasury regulations on vessels leaving for United States ports as a preliminary to granting the bill of health. It being subsequently learned that some emigrants from the infected territory took ship at Trieste and Fiume, Austria-Hungary, Asst. Surg. A. D. Foster, also on duty at Naples, Italy, was instructed to proceed to these points to ascertain if emigrants from cholera-infected regions left these ports for the United States, and to see that the Treasury regulations were enforced.

In view of reports received from these officers, the Department of State was requested to instruct the consuls at Hamburg, Bremen, Rotterdam, Amsterdam, Antwerp, and other ports in continental Europe from which Russian emigrants embarked to the United States and the consuls at Trieste and Fiume to enforce the Treasury regulations requiring five days from Russian border prior to embarkation for the United States.

Prompt measures were taken by health officials in the German Empire to prevent the spread of the disease, and on November 23, 1905, the restrictions against the embarkation of Russian emigrants destined for the United States were removed.

THE FRUIT PORTS OF CENTRAL AMERICA IN THEIR RELATION TO THE UNITED STATES.

The relation of the fruit ports of Central America to the United States in the matter particularly of yellow fever is so intimate that all facts bearing upon their sanitary condition and their public health administration are of great importance. As seen in another portion of this report, international sanitary conventions of the American Republics are provided for by a resolution of the Second International Conference of American States held in Mexico City, 1901–2. Two conventions have been held, at which the quarantine restraints which are necessary have been considered and the sanitary conditions of yellow-fever ports have been discussed. The last convention, held in Washington in October, 1905, provided an agreement between the American Republics concerning the quarantine treatment of yellow fever, but more than this is necessary.

As I have endeavored to show in previous reports and in an address delivered before the quarantine convention held in Chattanooga November, 1905, to thoroughly protect all the southern ports of the United States, as well as the ports of our southern neighbors, from the invasion of yellow fever, broad measures should be taken to eliminate in all ports the conditions which breed this disease. Already the influence of the officers of this Service on some of the smaller ports of our southern neighbors has had marked effect, and as will be seen by the following reports, efforts are being made in a number

of yellow-fever ports to eliminate the causes which develop and maintain the yellow-fever infection.

As indicating the resolve in this regard of certain countries, attention is invited to the correspondence between the Government of Honduras and this Government relative to the sanitation of the principal ports of the former country. A request was received in October, 1905, from the President of Honduras through the American consul at Tegucigalpa and the Secretary of State of the United States for the services of a competent medical officer to take charge of the sanitation, particularly of the department of Cortez, in the interest particularly of the fruit trade in that district. Through the consul of Honduras at New York arrangements were effected by which a competent medical officer of the Public Health and Marine-Hospital Service was given by the Treasury Department one year's leave of absence without pay, and at the same time a contract was made by this officer with the Honduranian Government for service of the character above described with ample compensation. Passed Asst. Surg. T. F. Richardson therefore was engaged under contract by the Honduranian Government, but unfortunately, while on his way to Puerto Cortez, was stricken with typhoid fever and died at New Orleans. No arrangement has yet been perfected for like service by another officer, but the incident shows the desire to bring the fruit ports into such sanitary condition as will eliminate the danger of commercial intercourse because of yellow fever.

With the assent of the proper authorities, the Panama Government has employed a medical officer of the Canal Zone as quarantine officer and sanitarian at the fruit port of Bocas del Toro, Panama.

The fruit companies are also bent upon giving their aid to the same end. In January of the present year an invitation was received by the Bureau from Mr. C. H. Ellis, manager United Fruit Company, to have representatives of this Service accompany a party of observation which had been arranged by the fruit company to inspect their several fruit ports, become familiar with them, and to advise as to the measures which should be taken at each port. Accordingly Surg. J. H. White, on duty at New Orleans, and Passed Asst. Surg. Edward Francis, at Mobile, were granted authority to accept the invitation. The reports of Surgeon White and Passed Assistant Surgeon Francis contain so much information of present value that they are quoted almost in full in connection with the regular quarantine reports from the eight stations.

RESOLUTIONS REGARDING SANITATION AND QUARANTINE OF FRUIT PORTS.

The other members of the party of observation were representatives of the health and commercial interests of certain Southern States and cities. Their names are subjoined to the following resolutions unanimously adopted (with the exception of No. 5, as noted) at a meeting held during the return voyage on board the steamship *Anselm*, February 14, 1906:

Resolved, First. That we urge upon the Surgeon-General and the health authorities of the Southern States the necessity for the appointment of high-type representatives at the various Central American ports.

Second. That we urge these representatives to use their influence with the local authorities at the fruit ports to maintain a strict quarantine against their infected neighbors, if any, and to sanitate and protect their port against any possible sickness.

Third. That no detention of either freight or passengers, except for purposes of fumigation, be maintained against ports that are actually known to be healthy, such as Ceiba, Bluefields, and Limon, the same having been for the past year or more, and maintaining a strict quarantine against infected ports.

Fourth. That quarantine be applied against passengers, but not freight, from ports that have had yellow fever during the past twelve months, with a likelihood of a recrudescence of same.

Fifth. It is believed that in view of existing conditions at the port of Belize and the precautions being taken by the health authorities there to prevent further trouble, it may be arranged to bring passengers from there by detaining them six days at the quarantine station at Belize before boarding the steamer. (Doctor Goldthwaite and Mr. Craighead, of Mobile, dissented from this resolution, preferring five days detention in all instead of six days detention at Belize.)

Sixth. That the Central American Republics be urged, through the State Department, to adopt modern methods and means of sanitation at all their ports by furnishing them with a good water supply, by establishing good drainage and sewerage, and by abolishing the use of cisterns and other like water receptacles.

The following gentlemen were present at the meeting in their representative capacity, as follows: Dr. J. H. White and Dr. Edward Francis, United States Public Health and Marine-Hospital Service; Dr. Beverly Warner, the New Orleans Health Association; Dr. John N. Thomas, Louisiana State board of health; Dr. Henry Goldthwaite, quarantine board of Mobile Bay; Dr. J. R. Anders, Mississippi State board of health; Dr. J. W. McLaughlin, Texas State Health Department; Mr. L. H. Fairchild, New Orleans Cotton Exchange; Mr. H. T. Cottam, New Orleans Board of Trade; Mr. E. Damer, Commercial Club, Mobile; Mr. E. Craighead, Mobile Register; Dr. S. L. Henry, committee on quarantine, Louisiana house of representatives.

FRUIT PORT INSPECTION SERVICE.

The following-named acting assistant surgeons were detailed to the fruit ports of Central America, in accordance with custom, to enforce the regulations relating to fruit vessels which permit said vessels to enter ports of the United States without quarantine detention:

Belize, British Honduras, H. I. A. Cooke; Livingston, Guatemala, season of 1905, R. H. Peters; season of 1906, L. A. Wailes; Puerto Cortes, Honduras, season of 1905, C. S. Carter; season of 1906, P. J. Kahle; Ceiba, Honduras, W. B. Robertson; Tela, Honduras, C. K. Roe; Bluefields, Nicaragua, T. B. L. Layton; Port Limon, Costa Rica, D. W. Goodman; Bocas del Toro, Panama, Paul Osterhout.

Following are the instructions sent to these officers in Bureau letter of March 16, 1906:

BUREAU INSTRUCTIONS.

Referring to Bureau letter of March 12, 1906, approved by the Secretary and the President, detailing you for duty in the United States consulate at the above-named port under the provisions of the act of February 15, 1893, you are informed that your duties will consist in the enforcement of the United States Quarantine Laws and Regulations for foreign ports, including the inspection of all vessels leaving your port for ports in the United States, its dependencies or possessions, either direct or via other ports, and signing, in conjunction with the United States consular officer, the bills of health issued to same.

You will see that the special regulations for fruit vessels plying between infected or suspected fruit ports and ports of the United States, its posses-

sions or dependencies, are carried out. A copy of Department Circular No. 32, March 13, 1906, containing these regulations, is sent for your information.

By request of the Government of the Republic of Panama you are informed that vessels leaving your port for ports in Panama should be subjected to the same restrictions by yourself as if they were bound for ports in the United States.

You will take all due precautions to prevent vessels leaving your port for ports in the United States from carrying infection of yellow fever through the agency of the Stegomyia fasciata mosquito. The State Department has been requested to inform the consular officer at your port of your detail and to instruct him to transfer to you the public property left in his custody last year by your predecessor. As soon as possible after your arrival you will transmit a list of this property turned over to you by the consular officer to the Bureau for comparison with the list now on file here. The necessary blank forms to supplement the supply on hand at the consulate will be transmitted to you under separate cover, also copy of the United States Quarantine Laws and Regulations.

The disinfection of baggage and passengers' effects to prevent the infection of yellow fever is no longer required.

The supply of blanks consists of an individual certificate to be issued to each passenger about to embark on a fruit vessel bound for United States ports and a certificate to be issued in duplicate to the master of the vessel as an adjunct to the bill of health and duplicate bill of health. Fruit vessels without certificates from the United States sanitary inspector stationed at their foreign port of departure shall be subject to the general quarantine regulations of the United States upon their arrival at United States ports. (See Department circular above mentioned.)

One copy of each of these certificates issued by you should be inclosed with the weekly report from your station. At the close of each week you will transmit a report of conditions and transactions at your port upon the blank inclosed.

Should yellow fever break out at your port you will immediately cable to the Bureau particulars of the matter.

Complete records of all transactions must be kept in order that a report of the same may be submitted to the Bureau at the close of the fiscal year ending June 30, 1906. A report of transactions also should be submitted before your departure from the station at the close of the quarantine season, including the period between July 1 of the year and that time.

Should yellow fever break out at your port you will take the temperature of all the crew and passengers of vessels leaving for United States ports, and should any of them show a rise in temperature you will recommend their detention, unless a positive diagnosis that the case is not yellow fever or any other quarantinable disease can be made.

As soon as possible after your arrival you should ascertain the amount of supplies on hand, so that, if necessary, you may make timely requisition for replenishing the same.

An immediate acknowledgment of the receipt of this letter is directed, and you will report to the Bureau the date of your arrival at your station.

The following circulars embody the special regulations relating to the fruit trade:

(Circular No. 32.)

SPECIAL QUARANTINE REGULATIONS FOR FRUIT VESSELS.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, March 13, 1906.

To United States consular officers, masters and owners of vessels, collectors of customs, national, State, and local quarantine officers, and others:

To permit vessels from foreign ports with perishable cargoes of fruit to enter southern ports in the United States without detention, in accordance with the provisions of the quarantine regulations of April 1, 1903, the following special regulations are promulgated and will be enforced at the ports of departure and of arrival:

REGULATIONS TO BE ENFORCED AT FOREIGN PORTS SUSPECTED OF BEING INFECTED WITH YELLOW FEVER.

1. None of the crew shall be allowed to go on land except the captain or representative, who shall go only to enter and clear the vessel and only in the daytime.

2. No one from the shore shall visit the vessel except the quarantine officers, customs officers, and agent of the ship.

3. All laborers who may be taken on the ship for loading purposes must have no intercourse with the shore subsequent to their entry upon the vessel until their final discharge therefrom.

4. No intercourse is to be allowed with persons on shore, except as provided in the preceding paragraphs. All fruit intended for shipment on vessels lying at docks shall be graded and payment made for the same on shore or dock; such operations should not await the arrival of the fruit on shipboard. Fruit brought alongside by small boats or lighters shall be graded and necessary payment made over ship's side.

5. All passengers must embark from the regular ports and must have been under the observation of the sanitary inspector of the United States for at least five days prior to the departure of the ship and be provided with his certificate to that effect. Where passengers come from elevated and noninfectible points in the interior to coast towns for embarkation, they should not be required to pass the five-day period of observation in the latter places because of possible danger of developing malarial or other tropical fevers. They should be required to bring a certificate from the United States consul or a reliable physician, and the sanitary inspector shall satisfy himself that they have been at such elevated and noninfectible interior points for five days immediately preceding their arrival at coast towns.

6. Special attention should be paid to the sanitary condition and history of passengers arriving, directly or indirectly, from the Pacific coast towns of Central America.

7. All outgoing vessels must be provided with a bill of health in accordance with the law, and, in addition thereto, certificates in duplicate, signed by the medical officer attached to the consulate, giving the name of the ship, her master, the number of crew, a list of passengers, their sanitary condition, their ultimate destination in the United States, and stating the health condition of the port and surrounding country, of the ship and her crew, with any other pertinent information; also certifying that the vessel has complied with all the requirements of this circular for the port of departure. This certificate shall be attached to the bill of health and the duplicate to the duplicate bill of health, and shall be the evidence of compliance with the above requirements on which the vessel, arriving with a good sanitary history and in good sanitary condition, may be admitted to entry, without the usual disinfection and detention in quarantine. Holds of such vessels should be disinfected with sulphur, after discharge of cargo, when deemed necessary.

REGULATIONS TO BE ENFORCED AT FOREIGN PORTS INFECTED WITH YELLOW FEVER.

8. The foregoing rules and regulations shall apply also to vessels engaged in the fruit trade between foreign ports infected with yellow fever, or where yellow fever prevails, and ports of the United States, and are the special regulations provided for in paragraph 69, Exception B, of the quarantine regulations for domestic ports, April 1, 1903. Attention is called to the further requirement that these vessels shall carry no passengers, and also to the general regulations to be observed at all foreign ports where yellow fever prevails with regard to vessels leaving for the United States or its dependencies.

9. The vessel shall not lie where her crew will be exposed to the danger of contracting yellow fever, and at ports where the vessels lie at wharves the vessel must be moved into the stream or at least 200 meters from the wharf before sunset, and not return to the wharf before sunrise the following day, except at ports where previous permission has been obtained from the Bureau.

10. Water tanks, water buckets, and other collections of water about the vessel should be guarded in such manner that they shall not become breeding places for mosquitoes. The destruction of mosquitoes aboard must be insured as far as possible by the simultaneous fumigation—2 pounds of sulphur per 1,000 cubic feet, all openings closed for two hours—of all compartments which can be so treated without injury to the cargo. Pyrethrum powder, taking care

to sweep up and destroy the mosquitoes, may be substituted in the engine room at the option of the medical officer.

11. The vessel should sail immediately after this fumigation is completed.

12. All baggage should be rigidly inspected and the exclusion of mosquitoes assured.

NOTE.—While the foregoing are specific regulations for fruit vessels, it should be borne in mind that they relate only to yellow fever, and that in the event of an outbreak of any other quarantinable disease at the port of departure the general quarantine regulations for diseases other than yellow fever, approved April 1, 1903, should be enforced on these fruit vessels.

REGULATIONS TO BE ENFORCED AT SOUTHERN PORTS OF THE UNITED STATES.

13. Fruit vessels plying between United States ports and *fruit ports* where yellow fever is *known* to exist will not be admitted to entry under the provisions of these special regulations until they have been not less than five days from the port of departure before being admitted to pratique at the quarantine station at the port of arrival.

14. Fruit vessels without certificates of the United States sanitary inspectors at foreign ports and fruit vessels infected with yellow fever shall be subject to the general quarantine regulations of the United States. Persons exposed to infection in unloading cargo onto lighters shall be detained, after such exposure, as provided for other persons exposed to yellow fever.

15. Fruit vessels engaged in other business than the fruit trade, except carrying passengers, as provided and permitted in these regulations, will not be accorded the special privileges of these regulations.

16. Any officer of a fruit vessel detected in evading or violating these special regulations shall forfeit, for any vessel upon which he may subsequently be found or be engaged, any participation in the special privileges accorded by these regulations.

17. Fruit vessels trading with any ports infected with yellow fever must carry a competent, qualified physician.

18. Fruit vessels arriving with yellow fever on board or having had yellow fever on board during the voyage shall be placed in quarantine. The personnel shall be removed, with the exception of the master, the living apartments thoroughly disinfected, the vessel provided with a new crew, sufficient to care for her, and towed to the docks for the discharge of cargo. Upon completion of the discharge of cargo the holds shall be fumigated with sulphur and the vessel shall be towed to the quarantine station to take on her crew before proceeding to sea.

19. This circular supersedes all previous Department circulars relating to special quarantine regulations for fruit vessels.

LESLIE M. SHAW, *Secretary.*

(Circular No. 55.)

SPECIAL QUARANTINE REGULATIONS FOR VESSELS CARRYING FRUIT CARGOES BETWEEN CUBAN PORTS AND SOUTHERN PORTS OF THE UNITED STATES.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, June 23, 1906.

To United States consular officers, masters and owners of vessels, collectors of customs, national, State, and local quarantine officers, and others:

To permit vessels from ports of the island of Cuba with perishable cargoes of fruit to enter ports in the United States south of the southern boundary of Maryland, without detention, the following special regulations, in accordance with paragraph 69*b*, United States Quarantine Regulations, April 1, 1903, are promulgated and will be in force at the ports of departure and arrival, for the current fruit season only, or until November 1, 1906.

These special regulations do not apply to vessels engaged in the fruit trade between southern ports and ports of Central and South America, which vessels come under the provisions of Department Circular No. 32, 1906.

1. The vessels shall carry no passengers.

AT THE CUBAN PORTS.

2. They shall lie at moorings in the open bay and shall not approach any wharf. The cargo shall be loaded into the vessel from lighters, and there shall be no communication with the shore, except for the dispatch of necessary business.

3. They shall be cleaned immediately prior to taking on cargo and shall be maintained in good sanitary condition.

4. They shall be fumigated immediately prior to taking on cargo by an accredited medical officer of the United States, and the fumigation shall be certified to by him.

5. The requirements of paragraphs 1, 2, 3, and 4 shall be certified to by the medical officer of the United States upon the bill of health.

AT THE PORT OF ARRIVAL IN THE UNITED STATES.

6. On arriving at a southern port in the United States, the crew, except the master and two engineers, shall be removed from the vessel, and the crew thus removed shall be placed in quarantine.

7. The vessel shall then proceed to the dock in charge of a new crew, sent from the city for the purpose, and the unloading of the cargo shall be completed as rapidly as possible.

8. The unloading shall be completed by daylight. If not so completed, the vessel shall be hauled into the stream a distance of at least 200 meters from shore until after sunrise the following morning.

9. Immediately upon completion of unloading there shall be a simultaneous fumigation of all parts of the vessel by means of sulphur, 2 pounds per 1,000 cubic feet, for the destruction of all mosquitoes.

10. Upon the completion of the fumigation, the loading of outward cargo shall be commenced without delay, and immediately upon the completion of such loading the vessel shall proceed to sea, stopping at quarantine to pick up the crew there left.

11. The requirements of paragraphs 6, 7, 8, 9, and 10 shall be enforced and certified to by a quarantine official of the United States, of the State, or municipality, and the collector of customs will not issue clearance papers to the vessels until such certificate is presented.

LESLIE M. SHAW, *Secretary.*

(Circular No. 65.)

AMENDMENT TO SPECIAL QUARANTINE REGULATIONS FOR FRUIT VESSELS PLYING BETWEEN FRUIT PORTS OF CENTRAL AMERICA AND PORTS OF THE UNITED STATES SOUTH OF THE SOUTHERN BOUNDARY OF MARYLAND.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, July 5, 1906.

To United States consular officers, masters and owners of vessels, collectors of customs, national, State, and local quarantine officers, and others:

To permit vessels plying between fruit ports of Central America, where yellow fever is known to exist, and United States ports, to enter ports of the United States south of the southern boundary of Maryland, without detention, the following alternative to paragraph 13 of Department Circular No. 32, 1906, is hereby promulgated and will remain in force until further notice:

Said paragraph 13 of Department Circular No. 32, 1906, is as follows:

"13. Fruit vessels plying between United States ports and fruit ports where yellow fever is known to exist will not be admitted to entry under the provisions of these special regulations until they have been not less than five days from the port of departure before being admitted to pratique at the quarantine station at the port of arrival."

Whenever the master or agent of the vessel so desires, the following alternative is offered:

MEASURES TO BE ENFORCED AT SOUTHERN PORTS OF THE UNITED STATES.

Fruit vessels plying between ports of the United States and fruit ports where yellow fever is known to exist will be permitted to enter as soon as the crew, except the master and chief engineer, shall have been removed from the vessel and placed in quarantine at the station and the living quarters of the vessel thoroughly fumigated and a new crew placed in charge. The quarantine officer at the port of arrival shall certify the number of the crew removed and shall compare and verify the same with the bill of health of the vessel.

Immediately after unlading at the dock all parts of the vessel shall be simultaneously fumigated for the destruction of mosquitoes with 2 pounds of sulphur per 1,000 cubic feet of space. After such fumigation lading for outgoing cargo may commence.

The new crew will accompany the vessel to the quarantine station, when change of crew will again take place. If the vessel departs without cargo, the vessel may be fumigated en route to quarantine. The relief crew shall then remain at quarantine for the arrival of another vessel, or until relieved by the quarantine officer.

Two sets of quarters shall be maintained at the quarantine station—one for the local crew and one for the crew of incoming vessels—and both quarters shall be fumigated immediately after being vacated.

The requirements of these provisions, and each step and detail thereof, shall be certified by the proper quarantine officer before clearance papers are granted.

LESLIE M. SHAW, *Secretary.*

The following reports from the officers at the several fruit ports are arranged in geographical order from north to south:

BELIZE, BRITISH HONDURAS.

Season of 1905 (July 1 to October 31).—Acting Asst. Surg. W. H. Carson was on duty until the date of his death, July 25, 1905. His duties were temporarily performed by the United States consul until September 3, when they were taken up by Acting Asst. Surg. H. I. A. Cooke. Doctor Carson had reported by cable May 24, 1905, 2 cases and 1 death from yellow fever in Belize. He reported it promptly, as soon as it was known. From May 24 to November 30, the end of the close quarantine season, there were 10 cases and 7 deaths officially reported.

Doctor Cooke, in his report dated November 3, 1905, after giving credit to the local government for efforts made from time to time to improve the sanitary conditions of the town, states as follows:

Unfortunately it is true that yellow fever was there for some time before it was diagnosed and reported, but it is to be emphasized that the late acting assistant surgeon, Doctor Carson, did all that a man could do in dealing with local conditions as found. An endeavor has been made to find out the source from which the fever entered Belize, and how. After careful inquiry the statement is justified that it was from the southern coast, probably Guatemala; not the seacoast ports, but from the interior towns. Two facts lead to the above conclusions. In December, 1904, a Spanish circus, Lopez's, came to Belize from Salvador, traveling through the interior towns of Spanish Honduras and Guatemala. At that time there were rumors that people were dying rapidly from a bad fever, attended frequently with black vomit, along the Guatemala Railroad. This circus entered Belize and remained several months, several of the people getting sick and leaving the show.

In March a pilgrimage of Spanish Catholics left Belize for Escapeula, an inland place of Guatemala, attending a Catholic festivity; on the way several were taken sick, one of whom died on the train from the so-called "railroad

fever;" the others returned to Belize, several being sick. Unfortunately Doctor Cooke can not find out to his satisfaction all about these patients, as many of them had no physician; their description of the sickness is, however, very suspicious. Soon after the above people came to Belize an epidemic of some kind of sickness was prevalent, each physician giving his own diagnosis, as will be observed on attached mortuary lists; the fact remains that they died, and the mortality shows a marked increase. (See, also, the assistant colonial surgeon's memorandum on fevers; this physician, J. H. Harrison, had the finest opportunity for observation and is the sanitary officer of the town.) In conversation with the colonial surgeon, Dr. C. H. Eyeles, it was elicited from him that in consultation with Doctor Harrison the latter was told to watch the case carefully, as it was suspicious; no precaution was taken except to destroy bedding and clothing after death. No autopsy was held, though another physician tried to have it done.

The same thing occurred in the case of Miss G. B. Later, when the reverend Crook died, it was shown by autopsy beyond doubt to be yellow fever, and no doubt to have started from Miss B's. case.

Permission has been obtained from the colonial surgeon, C. H. Eyeles, for free access to the public hospital for observation, and some interesting cases of malarial fevers have been seen; beyond hospital observation there is no opportunity for observation, unless one becomes intimate with each practitioner.

Statistical report, season of 1905.

	July.	August.	September.	October.	Total.
Number of crew	407	371	308	244	1,330
Number of passengers	17	5	4	16	42
Number of transit passengers	1	10	4	0	15
Number of vessels inspected only	2	2	3	2	9
Number of vessels fumigated	14	10	10	7	41
Total bills of health	16	12	13	9	50

Doctor Cooke reports, under date of July 2, 1906, for the season of 1906 (to June 30): No new case of yellow fever has occurred in this town since November 28, 1905, when the last case died. This case is interesting from the fact that it occurred after quarantine had been raised, and it was then thought that no yellow fever existed in the colony. This young Englishman, a Mr. Curtis, came on one of the Liverpool steamers via Colon, arriving on the 14th. He spent a few days and proceeded on to Stann Creek, from which place he was brought back to Belize ten days later, suffering from a severe case of yellow fever. His case was not diagnosed until after death.

One suspicious case of yellow fever was reported on the 11th of June. Observation proved the case to be malaria with bronchitis. The boy recovered. The sanitary condition of the port has not materially improved, as there still exist a great many low, swampy lots in certain sections of the town which could be filled in if the Government would take steps in the matter. An ordinance was passed over eight months ago requiring all water cisterns to be screened, yet to-day it may be safely stated that less than 50 per cent of all cisterns have been screened. Now that the rainy season has set in, there is a good deal of surface water to be seen, and anopheles and stegomyia are very much increased. This port requires vigilant attention, as observation of the method of enforcing quarantine against adjacent infected regions justifies one in stating that yellow fever may recur here at any time.

Statistical report, season of 1906.

	Mar. 22.	April.	May.	June.	Total.
Number of crew	139	282	270	325	1,016
Number passengers	15	29	28	15	87
Number of transit passengers	0	1	0	1	2
Number of vessels inspected only	0	2	2	0	4
Number of vessels fumigated	5	7	8	10	30
Number of bills of health	5	9	10	10	34

In reporting upon the tour of inspection of the fruit ports in January and February, 1906, under the auspices of the United Fruit Company, Surg. J. H. White states as follows regarding this port of Belize, British Honduras, under date of February 19:

We arrived at Belize on the morning of February 8, and beginning immediately upon reaching the shore, I made as thorough an investigation of the whole town as was possible, accompanied part of the time by the colonial surgeon, Doctor Eyles, who offered me every facility for the inspection I desired, and voluntarily showed me all the worst things in the place, all of which, I may say, I demonstrated to my own satisfaction later on in strolling about alone.

This town, with a population of some 9,000, occupies a flat plain nowhere rising more than 2 feet above the sea level, and in many places barely 6 inches above the high water mark. These low places frequently flooded by storm tides, can not of necessity present a very sightly appearance, but this latter, remaining after the subsidence of the tide, is in itself a guaranty that neither of the disease-breeding varieties of mosquitoes can find a breeding place therein. The streets, many of which are canalled down the middle in order to perfect drainage, are clean, as are the houses, including those occupied by the Carib natives. Indeed, there are few if any small towns in our southern country as clean as this small Central American city. A wide skirt of swamp has been cleared around the city, and this clearing will finally be extended to the high ground in the rear, the intention being to clear and fill up the whole swamp.

In addition to the removal of unsanitary conditions in Belize, the only other obstacle is to be found in the undoubted presence of an abundant supply of stegomyiæ, but the authorities are going about the task of abating this pest in a thoroughly systematic fashion, having screened all the water tanks belonging to the colonial municipal authorities and having ordered the screening of the whole town under the provisions of an ordinance, a copy of which I shall inclose, by the terms of which the work is done block by block, the authorities assuring themselves that material is obtainable to do the desired amount of work before the order for that work is given. There is an atmosphere of sincerity and of clean purpose pervading the official life of this colony which inspires confidence, and the results of their work will, I believe, justify that confidence.

The authorities have provided at their quarantine station ample detention barracks and ample hospital accommodations, everything about both of them being so satisfactorily arranged that there should be no hesitation in accepting passengers who have been detained in these barracks the proper length of time, as being then free from danger.

The fruit loaded at Belize does not come into the city, nor near it, it being impossible for a vessel to approach anywhere near the shore.

I believe this port to be entirely safe from the standpoint of freight shipments and reasonably so from a passenger standpoint on account of the fact that vessels have to load in the offing and also by reason of the very creditable showing which the authorities of British Honduars have made in the way of sanitary work.

Passed Asst. Surg. Edward Francis, who was on the same tour of inspection as Doctor White, in his report of February 20, 1906, states, concerning Belize, as follows:

Belize, British Honduras, has a population of about 10,000, mostly Jamaica negroes. This is a British colony, and it has a most excellent government. Dr. C. H. Eyles, the colonial surgeon, and Dr. J. H. Harrison, the quarantine officer, are men of the highest character and are actively directing the sanitary work of Belize along correct lines.

The city has a good municipal hospital and is just completing the screening of a large building for use as a detention and infectious hospital. Twenty-mesh copper wire is being used in the screening. A screening and fumigating ordinance (a copy of which is hereby inclosed) is just going into effect.

There are no docks at Belize, and ships have to lie about 2 miles from shore to find sufficient depth of water. No fruit is taken on at Belize proper, but it is brought to the steamers in barges all along the coast as far south as Stann Creek, which is a small place 30 miles from Belize.

During last summer Belize had 16 cases of yellow fever and 8 deaths. The details of the epidemic may be learned from the report of Dr. C. H. Eyles, colonial surgeon, who kindly handed me a copy of his report, which is herewith inclosed.

LIVINGSTON AND PUERTO BARRIOS, GUATEMALA.

Acting Asst. Surg. R. H. Peters reports, in part, as follows for the season of 1905 (July 1 to October 31):

Thirty-five vessels were inspected and cleared from Livingston and Puerto Barrios, Guatemala, for ports in the United States; 929 crew were inspected and 17 passengers given certificates, of which number 9 were aliens. Of the number of vessels cleared, 24 were from Livingston and 11 from Puerto Barrios. Their destinations in the United States were as follows: New Orleans, 12; Mobile, 17; New York, 2; Gulfport, Miss., 1; Carrabelle, Fla., 1.

Regularly visited Puerto Barrios to inspect vessels and issue certificates to passengers clearing from said port.

During the month of July there were 14 cases of yellow fever in Livingston, of which number 7 terminated fatally. From July 30 up to October 9 Livingston was apparently free of yellow fever, as there was very little sickness in the port, and the few deaths were from other causes, phthisis and diarrhea being the principal causes.

On October 9 there was a case of a native who came to Livingston from the coast, since which date there have been no more cases, making a total of 15 cases and 7 deaths; with the cases in June (12 cases and 5 deaths) a total of 27 cases and 12 deaths. Besides these known cases there were undoubtedly others of a mild form which never came under observation.

Puerto Barrios remained free from the infection and was remarkably healthful this season. During the months of July, August, September, and October there were but 4 deaths in the place.

Acting Asst. Surg. L. A. Wailes reports, in part, as follows for the season of 1906 (to June 30):

Considering the epidemic which prevailed at Livingston and along the north coast of Guatemala and Honduras from Belize to Puerto Cortez during the past quarantine season, extending to the interior accessible pueblos, with the utter neglect of all sanitation, Livingston and the country adjacent have until about the 1st of June, been in a remarkably healthful state. There has not been the slightest suspicion of yellow fever. Until June the place has been even remarkably free from malaria, except those cases so frequent on the coast of all tropical America, of chronic malarial cachexia. Since about the 1st of June, with the daily floods and excessive heat, there has been a most notable increase of malaria, chiefly of the tertian intermittent type, and a great deal of dysentery and diarrhea of a very grave and intractible type. Similar conditions prevail at Barrios, and the pueblos and stations along the Guatemala Northern Railroad and in the pueblos and towns around Lake Yzabal.

In Barrios there has been no death. In Santo Tomason one child.

There was an abortive pretense at sanitation, and a local board of health was organized, and some good sanitary measures formulated, such as disinfection, fumigation, screening cisterns, etc., with the quarantining against the ports on the coast, etc., and received the municipal official sanction, but with the exception of screening a few cisterns by the foreign population, nothing was done to enforce the measures, and after two or three meetings all interest was lost, and the board of health and sanitation died of inanition.

There have been dispatched from Livingston 18 vessels, from Barrios 23, making 41 in all. I would call attention to the fact that only 2 ships come to Livingston, these making semimonthly visits only, and call first at Barrios, and could as soon be dispatched from that port This is accounted for by the fact that the rapid pushing toward completion of the Guatemala Northern Railroad, which has its terminals at Barrios, is rapidly diverting all trade from Livingston. In a short time all exports, of which coffee is the chief, will be shipped through Barrios, and the small amount of fruit at this port will not call for more than one ship per week. Commercially Livingston is dead. The filling up of the harbor with the silt brought down Rio Dulce

renders it impossible for steamers to approach within 2½ miles of the wharf. The probabilities of improvement are very remote unless foreign capital and business enterprise take it in hand.

Surg. J. H. White, in his report of his tour of inspection, dated February 19, 1906, states as follows concerning Livingston:

On February 11 we visited Livingston, which must be considered, from a natural sanitary standpoint, an ideal place, situated as it is on high ground with a splendid water supply easily obtainable from the hills, if such was deemed advisable, with natural health conditions of the best sort, as is evidenced by the fact that no physician is needed in this community of some 4,000 souls, but which, by reason of the pernicious water system, is a perfect haven for the *Stegomyia fasciata*, while the houses, for the most part built in the Indian style, present greater obstacles to disinfection than any other town we visited. Fortunately it is so far away from the roadstead and so absolutely beyond the reach of a wharf that it has not offered any serious menace and probably will not, when the further fact is borne in mind that nearly the entire population consists of Caribs, who seem to be practically immune to yellow fever, as shown by the dying out of the disease last summer when all of the whites had been stricken.

Concerning the same port of Livingston Passed Asst. Surg. Francis reports, under date of February 20, 1906, as follows:

Livingston, Guatemala, was the last port we visited. It has an ideal location on high land at the mouth of the Rio Dulce and has a population made up almost entirely of Caribs. We found here the usual rain barrels and stegomyia wiggle tails.

It is reported that there were about 50 cases of fever here last summer, confined to the people of mixed Spanish and Indian blood.

The ships have to load at sea from lighters about 2 miles off shore.

Concerning Port Barrios, Guatemala, a port located within a few miles of Livingston, Surg. J. H. White, in his report dated February 19, 1906, states as follows:

Port Barrios, a twin town of Livingston, but a town only in name, should be removed before it becomes a town in fact, Santo Tomas, where dry and high ground exists, being the best point on the bay for the establishment of a town. No such ground can be obtained at Port Barrios, unless it be artificially created, the town being literally a salt marsh and containing no more than a dozen houses.

We reached the next port visited, Port Barrios, Guatemala, on the morning of February 11. This place is simply important as the terminus of the Guatemala Railroad, extending 135 miles in the direction of Guatemala City and having on its line the two most badly infected places in Central America during the past season, they being Gualan and Zacapa, which furnished a death list, respectively, of 600 and 800.

I am reliably informed that at the present time conditions are so bad in Gualan and Zacapa, as well as at other points in the interior, that there will doubtless be a recrudescence, nothing having been done to prevent the same, unless the full swing of the disease immunized the total population.

I wish to call attention to the fact that Port Barrios offers a peculiar menace to us by reason of its interior connections over the Guatemala Railroad and by natural conditions which will grow worse as the town expands, unless it, like Belize, is converted by numerous canals into a small Venice and is provided with a good water supply.

Passed Asst. Surg. Edward Francis, in his report of February 20, 1906, on Port Barrios, states:

Port Barrios, Guatemala, is a small town of about 200 Jamaica negroes, and here again were plenty of stegomyia wiggle tails. The dock runs out about 1,000 feet from shore.

Barrios is the shore terminal of a railroad which runs inland 185 miles to El Rancho and will be completed to Guatemala City, a distance of 197 miles. Guatemala City has a population of 80,000 and is about 5,000 feet above sea level. Zacapa has about 8,000 inhabitants, is 47 miles inland on the railroad, 21 miles from Barrios, and had fever last summer.

We did not visit any places on the railroad. Santo Tomas is a very small place about 3 miles from Barrios, across the bay, and had fever last summer.

Barrios claims to have had no fever in 1905, but that cases of fever from Livingston went straight through Barrios to Zacapa without stopping in Barrios.

PUERTO CORTES, HONDURAS.

Acting Asst. Surg. C. S. Carter reports, November 1, 1905, in part, as follows for the season of 1905 (July 1 to October 31):

The only quarantinable disease prevailing during the period from July 1 to October 31, 1905, has been yellow fever, and the last case reported was by the Government physician, September 25, and died on October 29.

The total number of cases reported during the month of July was 30, 7 deaths; August, 6 cases, 3 deaths; September, 1 case, 1 death; October, none; total, 37 cases, 4 deaths.

The total number for the season, including Cienaguita, a small village across the bay, also Tulian, in the same neighborhood, is 138 cases, 47 deaths. Three more deaths reported to the police station were reported as deaths occurring from yellow fever.

During the period from June 18 to October 31 the railroad line from Puerto Cortes was infected, with Choloma, San Pedro, Rio Blanco, and Chamelicon. The last case of yellow fever reported in Choloma died October 24, the last case reported in San Pedro died October 26, and the last case reported in Chamelicon died September 29.

The total number of cases and deaths reported officially on the line of the railroad up to date is as follows: Puerto Cortes, 138 cases, 50 deaths; Choloma, 150 cases, 58 deaths; San Pedro, 625 cases, 148 deaths; Chamelicon, 150 cases, 23 deaths; Rio Blanco, 2 cases, 1 death; total, 1,065 cases, 280 deaths.

Regarding the sanitary measures that were taken, a great deal has been done in the way of oiling and filling up holes, destroying water containers, etc., and good work has been done by the health boards of both San Pedro and Puerto Cortes. Simultaneous disinfection has been done in both the towns, as well as house-to-house disinfection where sickness occurred, in connection with the treatment of patients under screens or mosquito bars.

This has been the only time since 1892, when the very severe epidemic of yellow fever occurred all along this line of railroad and the number of cases and deaths were very high, nearly wiping out the town of San Pedro, and this is the first time a fight has been made to hold the disease in check. The boards of health of the towns of Puerto Cortes, San Pedro, and Choloma deserve great credit for what has been done, and with very little trouble and expense these towns could all be put and kept in good sanitary condition.

In regard to the recurrence of the fever next year, I would say that I hardly see how it can be avoided on account of the number of persons who will come into San Pedro and Puerto Cortes who left both towns for the mountains during the prevalence of the epidemic and are now returning to their several vocations, although after the terrible epidemic of 1892 no cases were reported in 1893.

During the present epidemic, with the exception of Rio Blanco that had 2 cases and 1 death, none of the other small towns were infected. Also none of the towns between Puerto Cortes and Ceiba, nor the towns of the Bay Islands. Omoa, 25 miles away across the bay; Cienaguita and Tulian, also just across the bay, had 21 cases and 6 deaths all told. Omoa proper had not a single case, although in direct communication with the other two towns.

Shipping from Puerto Cortes.—Owing to the quarantine measures adopted by the Honduranean Government against New Orleans and along the railroad line by the local health boards, very few steamers have cleared with fruit, the total number being 76, including 2 sailing vessels for New York, against a total of last year's shipping of 135 vessels.

This was caused partially from the rigid quarantine observed by the smaller towns along the line, who would not allow the railroad to handle the fruit.

Passengers.—Only one passenger was carried to southern ports during the last four months, and that by special permission granted. As the vessel carried no freight, certificates were refused.

Health of crews.—Crews have been inspected to the number of 732 men during the period from July 1 to October 31, making a total for the season of

1,794. No cases of severe illness have occurred on the steamships at the port, except one which arrived from New Orleans with one case of yellow fever on board, which recovered. No more cases developed. The steamer was placed in quarantine by the authorities, and was not allowed to discharge cargo, and was ordered back to New Orleans by the company after undergoing detention of nearly seven days. The patient was not allowed to be removed from the steamer. Several of the crews of the different vessels had a rise in temperature while in the harbor, but which proved to be nothing serious; all, however, were noted on certificates and bills of health.

Some arrangements should certainly be made by the companies to remove sick sailors for observation, as it would save time and also loss of cargo if detained in quarantine. Several times they have refused to remove sailors, partially because there are no accommodations except hotels, who do not care to receive them, and there were no hospital accommodations; also the authorities would not permit it, although, with the exception of the steamship *Nicaragua*, nothing of a serious nature occurred.

Disinfection of vessels.—All vessels have been disinfected before leaving since May 25. The holds have been disinfected as well as the living quarters. Vessels did not load at the wharf at night or discharge cargo. During the time that yellow fever prevailed steamers discharged in the daytime and went out into the stream at night, coming back to the wharf at daylight.

As a usual thing steamers were in a good sanitary condition; if not, they were made so before receiving their papers.

The inspectors placed on the vessels by the State boards of health usually handled their ships well and kept them in good sanitary condition.

Acting Asst. Surg. P. J. Kahle reports, for the season of 1906 (to June 30) at Puerto Cortes, as follows:

Vessels inspected, 72; crew inspected, 1,414; passengers inspected, 24.

Concerning Puerto Cortes, Honduras, Surg. J. H. White, in his report dated February 19, 1906, states as follows:

We arrived at Puerto Cortes the morning of February 10, about 4 o'clock, finding here a town with natural conditions which entirely justify malaria but which would hardly justify an epidemic of yellow fever if reasonable precautions are taken to prevent the breeding of the mosquito. The railroad from the interior makes a long crescent on the shore of the bay, at the upper end of which the town is situated, the place consisting, practically, of two rows of houses, one on either side of the railroad, the terminus of the latter being the wharf. In front of the place is the sea, while in the rear is a salt-water marsh which in some places comes up to within a hundred feet of the railroad track. The strip inside the railroad should be filled in and made high ground, with a canal through the middle, thus providing an outlet to the sea for the drainage inside of the railroad track. Here, as at Ceiba, there are mountain streams near at hand, in the case of Puerto Cortes, as I am informed, about 4 miles distant, with an abundant water supply.

At this port fruit is loaded from a wharf at the lower end of the town. This wharf should be extended so as to make the loading point farther from the town, or else the two or three dwellings near by should be razed, in order to isolate the wharf.

The country back of Puerto Cortes has been, and probably is at the present time, full of infection.

We received much valuable information from Dr. J. E. Austin, the physician of the United Fruit Company at this place, and from him we endeavored to ascertain, if possible, the origin of yellow fever in Puerto Cortes during the past summer. In regard to that matter Doctor Austin made the following statement:

"A good many negroes came over the trail from the Guatemala Railroad to this place. The first cases of fever which occurred here were in the latter part of April, in the persons of a Mexican and his wife who came from Belize. The man died three days after their arrival. These cases were unattended by any physician. The secondary cases were, one a lineman for the telegraph company, the other a young man in the lottery house. These were in different portions of the town. The first case in my own practice occurred on the 22d of May. After this the infection became general. After the development of the first four cases nothing in the way of sanitation was done in Puerto Cortes.

"Under date of November 22, 1905, the British vice-consul at this port reported to his Government that there had been the following number of cases and deaths at the places mentioned: San Pedro, 1,050 cases and 150 deaths; Chamelicon, 200 cases and 33 deaths; Santa Cruz, 4 cases and 4 deaths; Villanueva, 4 cases and 4 deaths; Chaloma, 336 cases and 94 deaths.

"On the 16th of January, 1906, a person named Walford died in Chaloma of yellow fever.

"The last cases in Puerto Cortes were on the 7th of December, 4 in number. There had been one or two cases in Puerto Cortes between the 22d of August and that time.

"No disinfection can be done here, the windows having no glass in them, but there is going to be some cleaning up before the quarantine period.

"It takes three weeks to make the trip across the mountains, so that the bringing of infection from the Pacific coast in that way is practically impossible."

From the above it may be seen that he is under the impression the yellow fever came from Belize, and subsequent findings made by us at Puerto Barrios lead me to the same conclusion, though there is no real certainty as to whence it came.

The Honduranian Gulf port of the Puerto Cortes and the Guatemalan ports of Livingston and Port Barrios, for the present season at least, offer the most pronounced threat, and I beg to suggest that they should again be inspected, some few weeks hence, by some competent officer, to ascertain whether anything has been done to eliminate the fever in the interior of Guatemala, as concerns Port Barrios and Livingston, and in the interior of Honduras in respect to the town of Puerto Cortes.

Concerning this same port of Cortes, Republic of Honduras, Passed Asst. Surg. Edward Francis makes report in part as follows, under date of February 20, 1906:

Puerto Cortes, Republic of Honduras, has about 2,000 people and is in close relation with Cineguita, a small collection of houses just across the bay. These two towns had between 150 and 300 cases of yellow fever last summer.

At Cortes the vessels load at the dock, which must be considered a dangerous place, for the dock is a short one and plenty of stegomyia were found breeding within 20 yards of it.

We visited a building which was used for reception of yellow fever cases during the epidemic. It has a thatched roof, a muslin ceiling, and mosquito netting over the windows. Just in the rear of the building were myriads of stegomyia breeding in rain barrels.

A railroad extends 61 miles inland from Cortes. San Pedro is a town of about 10,000 people, is about 35 miles from Cortes, and had about 1,000 cases of fever and 150 deaths last year.

Choloma on the railroad, 28 miles from Cortes, is a town of about 20,000 people, and had 150 cases of fever last summer.

There was some evidence in Cortes of the screening of cisterns, but it was completely overshadowed by the countless open barrels of rain water alive with stegomyia larvæ.

We were told that Cortes could be supplied with water from a river a short distance away. We did not visit any of the towns up the railroad. Just before leaving Cortes we tied up at the dock for a half hour and a little later found anopheles and culex on the ship.

CEIBA, HONDURAS.

Acting Asst. Surg. W. B. Robertson reports, in part, as follows for the season of 1905 (July 1 to October 31):

Number of vessels inspected, 69; number of vessels disinfected, 33; number of crews inspected, 1,285; number of passengers inspected, 39; number of aliens sailing from this port, 24.

Health of crews.—The general health has been good, but there were more cases of minor ailments giving rise to slight rises of temperature than in previous seasons, and in a few cases more marked febrile symptoms, but nothing of a suspicious character throughout the entire time. When such rises of tempera-

ture were found they were entered on the special certificate at the time of clearing.

Passenger traffic.—This was carried on in a spasmodic manner till July 22, the passengers being required by the companies to be provided with a special permit from the State board of health before they would carry them. On learning of the outbreak of yellow fever in New Orleans, all passenger traffic was refused by the companies, even on ships going to Baltimore, they claiming that the respective State boards of health refused to grant entry to passengers.

Health conditions of port.—From a quarantine standpoint these have been uniformly good during the entire season. For some six weeks after the outbreak of yellow fever at Puerto Cortes the people were rather alarmed as to the possibility of yellow fever getting in, and in consequence occasional false rumors were circulated; but, beyond one case of haemoglobinuric fever in an elderly alcoholic subject and one case of congestive malaria in a young man (both Americans), there was nothing of a suspicious nature during the time.

There was a slight increase in the prevalence of malaria and dysentery over that of previous seasons.

The season as a whole has been remarkably dry and warm compared to others. Generally the dry season breaks early in October, if not sooner.

Should the local authorities become lax in their precautions during the ensuing winter, it is quite probable that yellow fever will gradually work its way to this coast from the infected districts in the neighborhood of Puerto Cortes.

Local sanitation.—The present administration is taking steps to improve the streets and drainage of the town, and the collection of garbage is more systematic and the general cleanliness of premises is better than a few years ago. But the mode of construction of dwellings is such that it would be a practical impossibility to do efficient fumigation for the destruction of infected mosquitoes in case of an outbreak of yellow fever.

For several days prior to July 28 many rumors were reaching me of the presence of yellow fever in New Orleans, and the steamship people were contemplating sending their boats to Mobile without adequate fumigation. In consequence, on July 28, a code cable was sent to the Surgeon-General apprising him of these facts and asking for instructions. On July 29 the following cable was received from Washington: "Fumigate holds before fruit cargo taken on and living appartments just before departure for southern ports.—Wyman."

Immediately on receipt of this a circular letter was sent to the agents of the various fruit companies containing these instructions, and a reliable American was obtained and appointed to do the work of fumigating the vessels under the supervision of this office. This insured that this important work would not be slighted in any way.

All vessels destined for southern ports were fumigated according to Bureau requirements, with not less than two pounds of sulphur per 1,000 cubic feet of space.

Vessels coming from southern ports and bound for northern ports were likewise fumigated. But vessels from northern ports and bound to northern ports were not fumigated.

The season has proved a responsible one, owing to the many points of loading and extent of coast attached to this station, but everything has run smoothly and the season brought to a close without an untoward event.

CONDITIONS AND TRANSACTIONS AT CEIBA FROM THE DATE OF REOPENING, MARCH 19, TO JUNE 30, 1906, INCLUSIVE.

The boarding of vessels is done by boats furnished by the agent or master of the vessel for which the inspection is made. There being no wharf, the boat has to put off the beach through the surf, which at times is very rough. Owing to the uncertainty of loading, clearances have often to be made at night.

The duties of the acting assistant surgeon consist in: (1) A general supervision of the shipping entering the harbor. (2) Keeping a check upon the working of the ships. (3) Inspecting vessels, crews, passengers, and baggage, and issuing certificates of same. (4) Supervising disinfections when required. (5) Investigating the health conditions of the port and vicinity, noting same upon the bills of health, and furnishing weekly reports thereon.

So far as the service office is concerned, the conduct of the ships while loading at points along the coast is in the hands of the steamship companies. At the time of clearance the master of the vessel signs the file copy of the spe-

cial certificate in affirmation of the observance of the special regulations for fruit vessels while on this coast.

All vessels destined for New Orleans carry a marine medical inspector, appointed by the Louisiana State board of health, who is placed there to see that the regulations of his board are carried out.

Vessels destined for Mobile do not carry a sanitary inspector.

Methods of inspecting and certifying passengers.—The passenger traffic of the port is limited, consisting mainly of the well-to-do natives and commercial travelers from the United States.

Inquiry is made as to late residence, etc., and the present condition of health ascertained and checked by daily observation for at least five days before issuing certificate No. 8952.

On June 8 the resident medical inspector of the Louisiana State board of health received a cablegram from the president of his board forbidding the embarkation of passengers for New Orleans after that date. On June 15 a number (15) of passengers embarked on the steamship *Joseph Vaccaro* for New Orleans, having been granted special permission by cable. Since then no more passengers have been permitted to embark for New Orleans.

Passenger traffic for ports other than New Orleans still remains open, as this office has had no valid reason for closing same.

Inspection of baggage.—The general cleanliness of baggage and the absence of mosquitoes is determined by inspection; besides this, where needed, inquiries are made to ascertain the possibilities of infection by diseases other than yellow fever.

Mosquitoes on vessels.—Seldom, if ever, present on the vessels while loading on this coast, due, most probably, to the distance from shore at which the ships are anchored.

Health of crews.—This has been uniformly good, though on one or two occasions there have been slight rises of temperature, due to malaria or trivial ailments. One case of cholera morbus occurred in one of the marine medical inspectors on steamship *Colombia* on May 5.

General remarks.—From a quarantine standpoint the health conditions have been good since the opening of the season. There has been the usual prevalence of malaria, but, as far as can be ascertained, there have been no cases of the more pernicious types. The number of cases of dysentery have not been such as to call for special comment. Among children there have been a few cases of pertussis. The death rate has been about the same as in previous years, but accurate and reliable data are seldom obtainable.

The season has been exceptionally dry and warm, with almost entire absence of the usual showers. This led to a marked diminution in the number of mosquitoes for the time being, but they have increased again since the light rains set in.

Local sanitation.—Up to the present about the only effort that has been made toward an improvement in the sanitary condition of the town has been a little work in grading and draining a few of the principal streets. The streets themselves are not kept clean, and at times one can see piles of garbage lying about for a number of days before it is carted away.

The cleansing of premises is done in a very haphazard and inefficient manner. The condition of many of the cesspools is abominable. Almost every house possesses a water container of some kind, and these, being neither screened nor oiled, provide excellent breeding places for mosquitoes, which are numerous in some portions of the town, and of which the Stegomyia fasciata forms a good percentage.

In connection with these various coast towns, Ceiba included, there is no provision whatsoever for an isolation hospital, and, if yellow fever should strike the coast, it would find it wholly unprepared to wage any sort of a campaign against it. Furthermore, there is no provision made for anything of the nature of a house-to-house inspection, or even the systematic reporting of febrile cases. Should yellow fever be introduced it would likely be undetected or at least not reported.

In contrast to this indifference of the people stands out the bountiful provision which nature has made in the way of facilities for rendering the town of Ceiba a sanitary one. There is a gradual fall in the ground from the foothills to the sea which would render the draining and sewering of the town a comparatively easy matter. The adjacent mountains furnish rivers with pure potable water in such large volume as to be ample for every purpose. These streams would also furnish ample power for the generation of abundance of electricity.

The proximity of a high mountain range causes the daily alternation of land and sea breezes, keeping the air pure, with generally cool winds at night, which permit of restful sleep.

The institution and following up of proper means for the destruction of mosquitoes on the one hand and the elimination of their breeding places on the other would go far toward freeing the town of these pests and the malaria associated with them, as well as protecting it against the easy spread of yellow fever should a case, by inadvertence, be introduced.

Concerning Ceiba, Honduras, Surg. J. H. White, in his report of February 19, 1906, states:

The next point visited was Ceiba, where we arrived on the morning of February 6. This town, lying on a flat and sandy beach, about 8 miles distant from the Congrehoy Mountains, has a very marked natural sanitary advantage which could be easily utilized did the authorities see fit to do so. The ground is easily drained, being, for the most part, of a sandy character which does not hold water. The elevation above sea level, though very slight, is sufficient for the drainage of so small a place.

Two miles away the Congrejal River affords an inexhaustible supply of pure water at a sufficient altitude to require no pumping, and, though stegomyiæ are present, the houses, as a rule, are sufficiently well constructed to permit of the practical destruction of the house mosquito.

This town has no railroad communication, and, the ships being obliged to lie in the offing, it, like the town of Bluefields, is only in indirect touch with the outside world, and this, as in the case of Bluefields, probably accounts for its comparative freedom from fever.

Passed Asst. Surg. Edward Francis, in his report of February 20, 1906, states:

Ceiba, Honduras, is a town of about 4,000 people. She is clean and dry and depends on rain barrels for water and stegomyia. Near the town are two mountain streams—Congrejal and Dante—either of which could furnish her with excellent water. About 8 miles from the coast is a range of mountains which cuts off communication with the interior.

There are no docks, so the steamers take on fruit from lighters at Ceiba and for 30 miles up and down the coast.

Dr. V. C. Reynolds, who met our party as the special representative of President Bonilla, afforded us every opportunity for making our investigations.

TELA, HONDURAS.

Acting Asst. Surg. C. K. Roe reports, in part, as follows for the season of 1906 (March 24 to June 30):

Tela, being the nearest port to Puerto Cortez and the infected territory adjacent, is naturally watched with great solicitude. On my arrival in March I took immediate steps to learn what had been done to prevent infection and to what extent communication with the infected territory was guarded. I found the authorities fully alive to the importance of preventing the infection from entering their borders and that they had established a rigid quarantine. This was comparatively easy, as there are but two or three roads for travel, and these had been closed by placing guards at each crossing.

The sanitary condition of Tela will compare favorably with any other Central American town. There is little sickness, the prevailing trouble being of a malarial character.

The principal duties of the Service officer are to supervise the shipping that enters the port and see that the Service regulations are complied with. The boarding of vessels at the port has to be done in the open sea and frequently at night, and at times is accompanied by some danger owing to the rough sea. The ships are reached by boats furnished by the agent or master of the vessel to be inspected.

The passenger traffic is very limited, owing to the strict quarantine observed, none but residents leaving for the States. Anyone wishing to leave must notify the Service representative, who after satisfying himself that they have not been in any infected place requires them to report each day; and at the time of

their departure, if they are in good health, they are given a certificate to that effect. All passengers have been from this immediate place, and there being no infection it has been unnecessary to fumigate baggage. During the months of March, April, May, and June, 1906, 32 steamers have been inspected and passed, the total of whose crews numbered 675; passengers, 8. There are no sailing vessels.

BLUEFIELDS, NICARAGUA.

Acting Asst. Surg. T. B. L. Layton reports in part as follows for the season of 1905 (July 1 to October 31):

The general sanitary condition of the port and the surrounding country during the past four months has been good.

Bluefields and one or two of the stations on the Caribbean coast escaped yellow fever this summer. The disease has been north, south, and west in Nicaragua and in other republics.

In early July the report was received that towns in British and in Spanish Honduras were infected. Precautions were immediately taken to prevent the entrance of refugees. Instructions were forwarded to governors of ports along the east coast to inspect trading schooners, to admit none from infected points, and to permit only residents of their respective ports to embark for Bluefields. Later in the same month information was received that yellow fever had been introduced into New Orleans. Rigid quarantine was forthwith established against that port. Vessels upon arrival here were to be detained such time as would complete ten days from the port of departure. If they should come in without a marine medical inspector on board, the detention would be prolonged such time as would complete fifteen days since time of departure from infected ports. At no time until New Orleans should be declared entirely free from yellow fever were passengers to be permitted to land.

When these regulations were made known the Bluefields Steamship Company ordered two of the four vessels plying regularly to New Orleans to run to Mobile, Ala. The rigid quarantine against the Louisiana city soon caused the steamship company to transfer all of their ships to the Mobile route. The local authorities, upon receiving notice of this change, instantly decreed that steamers from the last-named port, should they arrive without a medical inspector on board, must undergo a detention that would keep them out of Bluefields until they had completed a sea trip equal to six days.

That Bluefields and the country immediately surrounding it escaped the infection that has been so widespread this summer can be attributed to certain advantages it possesses over other Central American seaports. First, between it and its neighbors on the Caribbean coast there is infrequent communication; second, the foreign trade is limited to one line of steamers that ply to a port or ports in the United States where yellow fever is not endemic and rarely prevalent; lastly, travel between Bluefields and cities in the interior of Nicaragua is primitive and necessarily slow.

The Stegomyia fasciata abounds.

During the first week in August yellow fever was reported present in the city of Managua, the capital of Nicaragua. Shortly after, Leon, Corinto, and Grenada were declared infected.

When the order transferring all vessels from the New Orleans to the Mobile route was received the Louisiana State board's representative ceased to board steamers and to interview passengers. This placed me in full charge and enabled me to enforce all service regulations without fear of conflicting with those of the State of Louisiana. That State demanded of all prospective passengers, irrespective of where they came from, that they be under observation during a period of forty-eight hours prior to the sailing of a steamer. As soon as I assumed undisputed charge I posted notices in the steamship company's office and caused others to be displayed in the local hotel and in several public places about the town. These notices were for the benefit of passengers, and informed them that they must report to service officer five full days before the departure of vessels. The reason for posting of these notices, with the regulations of the Service clearly set forth, is that the steamship company had requested me to enforce all regulations and to detain for five days even residents of Bluefields, the company wishing to safeguard their own interest, so as to avoid the possibility of Mobile, the only southern port in the United States open to them, to deny admission to their ships.

Additional reports of the yellow fever situation in the cities of the interior continue to reach Bluefields, each worse than the last. The infection was steadily spreading, and on or about August 27 a new focus was established in the town of San Francisco, Department of Segoria, in northwest Nicaragua. I know positively of two fatal cases that terminated in San Francisco on the above-named date.

It has been impossible to ascertain, even approximately, the total number of cases and deaths in any of the infected zones. The greatest fatality is said to have been in the capital. During a prolonged period it is reported that the cases there amounted to 30 each day, with an average death rate of 3. The largest mortality occurred among the convicts in the government penitentiary in Managua.

Beginning with August 4, all vessels plying between Bluefields and Mobile, Ala., by orders of the Mobile quarantine board, were under the care of a marine medical inspector on board. Their presence assisted materially in preventing indiscriminate communication between the steamers and the shore.

In compliance with instructions received in Bureau cable, dated Washington, August 7, sulphur was burned in the holds of vessels and in living apartments prior to their sailing. Marine medical inspectors had received the same orders from the Mobile quarantine board and had been equipped with pots and a supply of sulphur and alcohol. The fumigation was carried on faithfully and under my supervision.

Steamers arriving after October 17 were no longer required to be in charge of a marine medical inspector, and the Mobile authorities took from the vessels the supply of sulphur and pots. After the above date I did not fumigate; the ships were all plying to Mobile. That city had withdrawn the medical officers, deeming their services no longer necessary, and had taken from the vessels the supply of pots and sulphur.

On August 7 San Juan del Norte, Greytown, Nicaragua, notified the steamship company that no more fruit vessels would be received until further notice.

The interrupted passenger traffic between this port and Mobile was reinstated upon the receipt of a cable from Doctor Goldthwaite, executive officer of the Mobile quarantine board, informing me that passengers would be received after October 15.

During the week ending August 20 a report was in circulation that Mobile, Ala., had become infected. The local authorities immediately took steps to prevent the entrance of steamers from that port. And it was finally determined to require from all vessels a detention that would insure a lapse of six days between ports, the six days to be completed at sea. It was also decided to fumigate the mails. One steamer was compelled to conform to the new ruling. Shortly after, upon the appeal of the steamship company to the Service to report the conditions in Mobile, a cable was received denying that city to be infected. The local authorities at the same time were instructed by the President of Nicaragua to abolish the quarantine against Mobile.

The following statistics are herewith submitted:

Bluefields's officially estimated population, 3,500; total number deaths during past four months, 44; total number vessels inspected last four months, 39; total number bills of health issued, 39; total number crew inspected, 781; total number passengers inspected, 153; total number passengers destined for New Orleans, La., 51; total number passengers destined for Mobile, Ala., 3; total number passengers destined for other United States cities, 71; total number passengers for Panaman ports, 11; total number passengers for European and other foreign ports, 17; total number pieces of luggage inspected, 292.

Season of 1906 (March 21 to June 30).

No sanitary measures to promote the preservation of the public health have been or are being taken by the authorities. The stegomyiæ are the common house mosquitoes, while the anopheles are present in almost equally large numbers.

All steamers entering the port discharge their freight alongside the customhouse wharf at Bluefields Bluff, which is on the opposite side of the lagoon and 6 miles from the town of Bluefields. The return cargoes of fruit are loaded in mid-stream by means of lighters at points in the Escondido River, the chief centers being Rama and Kama. Just prior to their departure an inspection of their crews is made by me. Besides the fruit vessels, an occasional steamer engaged in the mahogany trade stops en route to northern United States ports;

does not actually enter the harbor and can not be boarded. To these ships a supplementary bill of health is issued.

The inspection of incoming vessels as carried out by the authorities is very unsatisfactory. The local port physician boards only the fruit steamers arriving from the United States. All other steamships, schooners, sloops, and native craft, with or without passengers, from South and Central American coast points, are admitted without examination.

The fruit ships plying between New Orleans and Bluefields have marine medical inspectors on board, representing the Louisiana State board of health. The Mobile quarantine board does not require medical officers on the vessels running to that port.

Shortly after my arrival the marine medical inspectors on the New Orleans steamers were of no assistance in preventing indiscriminate communication between the ships and the shore (and vice versa) and they insisted upon landing.

Their conduct, by force of example, had a prejudicial influence upon shipmasters, crews, stevedores, and laborers, making it difficult to enforce the special fruit-port regulations. Orders including all on board, without regard to persons, were issued to shipmasters, threatening to withhold bills of health unless the regulations were strictly observed. A more efficient quarantine is now being maintained.

The opposition on the part of the owners and masters of vessels bound for Panaman ports to the request of the Republic of Panama that whenever vessels leave a station where there is an officer of the Service they should be subjected to the same restrictions as if they were bound for ports in the United States was reported to the Bureau. The opposition was overcome by placing before the said owners and masters the reply of the Department, conveying the information that the said request did not include the taking of an American consular bill of health, and that should it be deemed advisable at any time to place any restrictions upon the vessels the restrictions should form the subject of a certificate to be offered to the masters of the vessels, which certificate it was understood the masters had the right to decline.

Rumors of smallpox in Rama reached the station late in the evening of June 11 last and were cabled to the Bureau on the following morning. I received Bureau reply by cable June 14, enjoining enforcement of paragraph 34 and stating vaccine had been sent. Thereupon the manager of the Bluefields Steamship Company organized a committee of two reputable American physicians to look into the Rama situation and invited me to accompany them. This invitation I accepted. The committee reported five mild cases of varicella and declared the rumors of variola unfounded. The results of the investigation were cabled to the Bureau June 20. The personnel of each arriving vessel has been vaccinated. The steamship *Corinto*, which loaded in Rama on the 23d (June), was the first to take on fruit there since the rumors first reached.

On June 21 last the proclamation of the Louisiana State board of health (effective from the 16th of the same month), quarantining against passengers from the entire Central American coast, was received here. On the 22d June the executive officer of the Mobile Bay quarantine board informed me by cable that Mobile would receive Bluefields passengers, subject to Treasury regulations.

The following statistics are herewith submitted:

Vessels inspected, 34; crew inspected, 735; passengers inspected (New Orleans, La.), 78; passengers inspected (Mobile, Ala.), 30; passengers inspected (Panaman ports), 10; crew vaccinated, 46; passengers vaccinated, 4; bill of health from Panaman ports viséed, 1.

Concerning the port of Bluefields, Nicaragua, Surg. J. H. White, in his report of February 19, 1906, states:

We arrived at Bluefields on the morning of February 3. This town lies at the shore end of a bay, the entrance to which is flanked by several keys, one, 7 miles distant from Bluefields, being used as a loading station, it being the only inhabited point actually reached by the ships. This key contains not more than two or three houses, together with a small office building, and any infection implanted there could be handled with the utmost ease and practically eradicated within one week. There are stegomyia mosquitoes to be found here, and it has been infected in the past, but having little population, has not attracted any attention. The fruit vessels proceed from this key up the Bluefields River and its branches to take on the principal portions of their cargoes, such portions of freight as are received at or dispatched from

Bluefields having to be taken to or from the ships by means of a stern-wheel steamboat of the type used on the rivers in the South.

Bluefields itself is built upon the slope of a hill, with a natural drainage so perfect that any refuse if left to itself must inevitably find its way to the sea.

A really very good system of sidewalks has resulted in the formation of some pools of stagnant water by interfering with the natural drainage, but these, of course, do not breed the stegomyiæ, which, however, exist to a very great degree all over the town, the supply being amply sufficient to create an epidemic at any time that a case of fever may be introduced; nor does there appear to be any prospect of an immediate effort to remedy this situation, the people feeling sceure in their distance from the shipping and the lack of general communication therefrom, resulting in a practical isolation from the outside world. It may be said that this confidence is, to some extent at least, well founded, while, at the same time, the abundant crop of stegomyiæ should serve as a warning to our inspectors at this as well as at other ports on this coast to keep constantly on the alert for fear that the disease may creep in unobserved.

Passed Assistant Surgeon Francis, in his report of February 20, 1906, states, with regard to Bluefields, as follows:

Bluefields, Nicaragua, has a beautiful location on the side of the hills and for this reason it could be given a good sewerage system and water supply. The city maintains a hospital, but it is not suited for the reception of yellow-fever cases, as it is unscreened and is breeding stegomyia at the rear. Stegomyia larvæ were found all over the city and back of the government wharf.

Fortunately for the city it has remained free from yellow fever for several years.

The fruit vessels, as they come and go, are either in the bay or in the Escondido River, and in any case are never within 3 miles of the city.

PORT LIMON, COSTA RICA.

Acting Asst. Surg. D. W. Goodman reports, in part, as follows:

Season of 1905 (July 1 to October 31).

Number of steamships cleared, 99; number of steamships having living quarters fumigated with burning sulphur, 51 (just prior to sailing); number of steamships having holds fumigated with burning sulphur before loading fruit, 34.

Crews to the number 4,096 and passengers to the number of 1,339 have been inspected and passed, all for ports of the United States or dependencies thereof: 32 bills of health for Panama ports were viséed, as requested by the Panaman Government.

During the four months covered by this report 100 deaths have occurred in Limon; 30 of these were patients brought from the banana farms to the United Fruit Company's hospital, leaving 70 to be properly attributed to Limon. Based on the estimated population of 4,000 this gives an annual mortality rate per 1,000 of 48.

Inclosed is a tabulated list of the number of deaths and the causes thereof in Port Limon, from April 1 to September 30, inclusive. Compared with the same period of last year the notable differences are the decrease in the number of deaths from malaria (39 to 23), and the increase in those from pneumonia (4 to 15).

About one year ago the Costa Rican authorities awoke to the necessity of sanitary work in Limon and of quarantine restrictions against infected ports. They made and enforced laws looking to the destruction of mosquitoes in Limon, and put into effect stringent quarantine against the ports of Panama, with the result that for more than twelve months this port and vicinity have been free from yellow fever, a condition which has not heretofore existed in the memory of the "oldest inhabitant."

With the present paucity of mosquitoes the danger of the spread of the infection should a case of yellow fever be imported would be reduced to a minimum.

Season of 1906 (March 22 to June 30).

One hundred and sixteen vessels bound for ports of the United States or its dependencies have been inspected and given bills of health. These vessels carried crews to the number of 4,875; transit passengers, 462, and passengers direct from this port, 1,032. Since June 20, the day the first case of yellow fever for this season was reported, 8 vessels bound for southern ports have been fumigated according to special regulations; 28 bills of health for Panaman ports have been viséed, as requested by the Panaman Government.

Seventy-seven deaths have occurred in Limon (in the same period in 1904 there fere 73; in 1905, 78). Of these, 25 were children 5 years and under, of which there were 6 of malaria, 8 of marasmus, 3 stillbirths, and 8 of other causes. Of the adults 12 were from malaria, 10 from lung diseases, 6 from bowel troubles, 4 from chronic Bright's disease, 1 from yellow fever, 3 from marasmus, and 16 from other causes. There has been a gradual increase in the number of deaths from malaria for the same period in the last three years, viz, 1904, 12; 1905, 14; 1906, 18, and this in the face of the greatly improved sanitary condition, the decrease in the number of mosquitoes, and virtually no change in the number of population. The cause, however, is found in the change in the nature of the population. There are fewer Jamaica negroes, and more native peons from the interior of this country, who have little power of resistance to the disease and easily succumb.

The sanitary condition of Limon has been much and favorably commented on during the past year, and deservedly so. My report of 1904 shows the then deplorable condition the town was in from a sanitary point of view, and the utter indifference of the authorities thereto. That of 1905 showed their awakening to the necessity of sanitation, the character and amount of work done, and the good results therefrom, in that there was no case of yellow fever in or around the port during that year.

On my arrival here, March 21, 1906, I found a very clean town, with very few mosquitoes. These, however, soon began to increase in numbers, and I was baffled in my search for their breeding places until I discovered that many of the tanks and barrels were screened last year with iron-wire gauze, which was rapidly rusting and leaving holes for the inlet of mosquitoes. On other premises the owners seeing the official surveillance had been removed, had partly removed the screens or were using barrels without them.

Concurrent with this was the laxity in enforcing quarantine regulations, especially against Colon after yellow fever was declared present in that port (May 22). Scores of passengers from Colon were admitted and scattered in Limon and throughout the adjacent country.

On June 16 an American came from near Zent Junction, a railroad station 22 miles from Limon; was in Limon four days when he was taken to the hospital, and on the 20th the case was diagnosed yellow fever.

The man died June 21, and the diagnosis was confirmed. On June 23 a Spaniard came from Zent Junction sick, slept in a boarding house in Limon that night, and was taken to the hospital next day. On the 25th the case was pronounced yellow fever, and on that day the room he had used in Limon was fumigated. This case has gone on to convalesence.

The Costa Rican Government and the United Fruit Company have each sent a physician to Zent Junction to trace and, if possible, find the focus of infection. Their reports as yet are negative.

There are hundreds of nonimmunes to yellow fever in Limon.

More than one-half of the vessels clearing from this port are fruiters, bound for Southern ports, and as such are subject to special regulations issued by the Public Health and Marine-Hospital Service.

Of the 77 deaths above reported, 56 may properly be charged to Limon, which, with its population of 5,000, gives an annual death rate per 1,000 of 44.8.

Concerning Port Limon, Costa Rica, Surg. J. H. White, in his report of February 19, 1906, states:

We arrived at Port Limon about daybreak on the morning of January 26. This city is situated on the mainland of Costa Rico, fronting the Caribbean Sea, and is built upon a flat plain, covering, as will be seen from the chart which I submit herewith, about 1½ square miles. The streets are well drained and fairly well paved with a species of macadam made from the coral rock. The whole town is provided with sewers, flushed by sea water, and has a good water supply. There are no cisterns, and the general character of

construction of the city is of such a nature as to render the work of eradicating yellow fever rather easy. Most of the buildings are of wood, but are fairly well constructed, those belonging to the United Fruit Company being, for the most part, of brick or steel and concrete, and of such a character as to present no difficulty whatever, either in keeping clean or in disinfecting, should infection occur.

The hospital of the United Fruit Company, with a special annex for yellow-fever patients, is situated in the northwestern part of the city, sufficiently isolated from the city proper as to prevent the spread of yellow fever to the latter, should it occur, and, with the exception that the screening wire is not sufficiently close in texture, it is admirably constructed, all patients being screened, no matter what their illness may be, and, incidentally, I may say that the United Fruit Company has promised to substitute 18-mesh wire for that now in use and to improve the system of doors, reducing, in the case of the yellow-fever hospital, the entrance and exit system to one door, guarded by a long vestibule, thus making it entirely possible to easily eradicate any infection which might obtain a foothold in any portion of the hospital.

I am informed that the sanitary regulations provided and enforced by Doctor Cespedes, the health and quarantine officer of the city, are of such a character as will tend to prevent the infection of the city, and, if the inspection made by him of the *Anselm* upon her arrival may be taken as a criterion, I would say that, for the first time on this coast, there is an effective quarantine inspection against outlying territory and the beginning of work in the right direction to prevent a recurrence of the disease.

The quarantine station, an island lying about half a mile to the northeast of the city, must, in all candor, be said to be at the present moment only a quarantine station in name and location, but it is the evident intention of Doctor Cespedes, who says he had his training under Doctors Gorgas and Carter, in Habana, to establish a good station on this island, including a thoroughly up-to-date yellow-fever hospital capable of taking care of a dozen or more patients. He has ordered the removal from all premises in the city of all kinds of receptacles which might act as a breeding place for the stegomyia, which order seems to have been very conscientiously obeyed both in letter and spirit, as, in going carefully about the city and looking into the rear yards of many premises, I saw no larvæ of this insect. There are breeding places, however, in the gutters of the houses, and this the Doctor is endeavoring to remedy, though I judge he will have great difficulty in doing so, as such places, in the very nature of things, are very difficult of inspection.

Taken as a whole, the city is clean and the population, consisting largely of Jamaican negroes, is tractable and under good discipline, being for the most part—indeed, I may say almost entirely—employees of the United Fruit Company.

The suburbs appear to my mind to offer in Port Limon, as they do in nearly every tropical and subtropical town, the principal menace because of the difficulty which a sanitary inspection encounters in reaching the breeding receptacles in such places, but these are, fortunately, of no great extent.

The point which I particularly studied here was the loading wharf and its relation to the city. This wharf is 1,400 feet in length, as may be seen by a further reference to the chart above alluded to, and, while it is covered by a shed, this latter is a well-ventilated, open steel structure which would hardly serve either as an abiding or breeding place for the stegomyia, in view of the fact that it is not at any time the habitation of man, while it should be also noted that the shore end of this wharf is some 500 feet distant from any building used as a residence. The steel shed does not entirely cover the wharf, but leaves, as is the case with all such structures, a space of some 30 feet in width between the edge of the wharf and the base of the piers supporting the shed. In loading vessels this distance is bridged by leather straps which carry the bananas, the fruit being placed on the shore end and taken up the straps by rollers. On the vessels it is received by Jamaica negroes in the hold, the stifling heat of which is a severe tax upon a healthy man and is in itself a sufficient guaranty that a yellow-fever patient neither could nor would endeavor to perform such labor.

The bananas are brought from the plantations in cars over a track which skirts the outer edge of the city, as may also be seen by the chart, reaching the wharf without going close to any habitation, these cars being loaded directly from the field, as I observed in a hundred instances, so that at no time does the banana come within a house, but always directly from the tree to the car.

thence to the leathern carrying straps and into the hold of the vessel, undergoing an amount of jostling and shaking up sufficient to dislodge any mosquito, even if such were inclined to take up their abode in a bunch of green bananas. While I can not speak from observation on this point, I am told, and from the appearance of things am inclined to believe, that the green banana as shipped from Central American ports is not attractive to the mosquito, while the ripe fruit undoubtedly is.

All things considered, I feel justified in saying that, in so far as the fruit itself is concerned, there is no risk involved in the shipment of bananas from Port Limon, and if the crews of the fruit-carrying vessels are so controlled as to prevent their going into the city, then there is practically no risk whatever in this trade, even were yellow fever existent in Port Limon.

I stated above that no stegomyia are to be found in Port Limon, but at the same time I think it is probable that there may be some there, owing to certain existent conditions, such as the gutters above mentioned and the cups formed by the junction of the leaf with the stem of the banana, the cocoanut, and other trees; consequently I believe it advisable that a close watch should be kept for stegomyia by the service officer on duty in Port Limon, as well as other fruit ports, the bureau being notified as soon as they are found, and, later, from time to time, as to the frequency with which they are discovered.

There are certain ports, such as Belize, Port Limon, and Bocas del Toro, which should be carefully watched, but which do not, in my opinion, offer at the present time the standing menace presented by other ports which I shall name. Port Limon, while classed with these other two ports, occupies in a measure a position by itself, being a port where the loading is done at a wharf, but it is equally as safe as the others, for the reasons which have been given in the description of the town, and in my opinion there has been a gradual recision in the number of mosquitoes there steadily going on since the completion of the water supply, paving, and drainage work, my belief being that ultimately this place will be proof against yellow fever through the working of natural laws under the conditions applied by the Government and the United Fruit Company.

Our party visited San Jose, and while there I had the opportunity of talking with an American physician, a resident of that city for some thirty years, who informed me that Punta Arenas, on the Pacific coast, generally considered as a menace by reason of its proximity to Panama and its lack of quarantine restrictions, was in such good sanitary condition and so comparatively free from the stegomyia as to very much reduce the danger existent in the past. This same physician informed me, very much to my surprise, that San Jose, with an altitude of 4,000 feet, undoubtedly had quite a considerable number of stegomyia, but that the disease had never been known to spread in the city.

Passed Asst. Surg. Edward Francis, in his report of February 20, 1906, states with regard to Port Limon:

At all ports which we visited we found the two ideal conditions for the maintenance of Stegomyia fasciata during the twelve months of the year, viz, temperature which very seldom falls below 70° F. and barrels about the houses for the collection of rain water, in which these mosquitoes breed. The larvæ of Stegomyia fasciata were easily found in great numbers at every port, except Limon, Costa Rica, where we failed to find them owing to the efficient work of Dr. Benjamin Sespedes, city health officer and quarantine officer of the port.

The United Fruit Company is very largely responsible for the excellent sanitary condition of Limon, having given her a sea wall, coral rock streets, cement gutters, sanitary sewers, a proper water supply, two excellent hospitals, and two magnificent steel docks extending out 1,500 and 1,000 feet from shore. The water is derived from the Banana River and it is piped all over town.

The yellow-fever hospital was constructed according to all modern requirements at a cost of $70,000 and fortunately is still waiting to receive its first case.

The other hospital is open to the employees of the fruit company and railroad and the poor of the city; it is thoroughly screened and modern throughout and is under the excellent management of Dr. Emilie Echeverria.

The quarantine station and a small hospital are on an island about two miles off shore; this hospital will be completed in a short time.

From Limon we went into the interior of Costa Rica by rail to San Jose, the capital, a distance of 102 miles from the coast. This city has a population of 25,000 and is 3,800 feet above sea level. Cartage, a city of 15,000 people, is on the same road 89 miles from the coast, at an elevation of 4,000 feet. There

was no opportunity to investigate whether stegomyia were breeding in Cartago and San Jose.

The question whether yellow fever might be brought to Limon from the Pacific coast by way of San Jose and the railroad was discussed with the Costa Rican authorities, who said that they were taking precautions against such a possibility. There is a very strong feeling in Limon that she will be protected by Doctor Sespedes from any invasion of yellow fever by sea.

An idea of the magnitude of the fruit business at Limon can be gained from the fact that she loads a ship every day with about 45,000 bunches of bananas.

None of the ships are loaded from lighters, but are all loaded from the outer thirds of the two long docks.

BOCAS DEL TORO, PANAMA.

Acting Asst. Surg. Paul Osterhout reports, in part, as follows:

Season of 1905 (July 1 to October 31).

Vessels inspected	55
Vessels fumigated	39
Ships' crews inspected	1,373
Passengers inspected and furnished certificates:	
To United States ports	26
To Port Limon, Costa Rica	3
To Canal Zone	47
Total persons inspected	1,449
Pieces of baggage inspected	40
Infectious and contagious diseases reported:	
Leprosy	1
Smallpox	2
Yellow fever, originating in this port	7
Yellow fever, removed from vessels	6

The last cases of yellow fever were reported October 15, 1905. No effort has been made to eradicate the infection, and until the place is put in a proper sanitary condition it will apparently be a menace to the Canal Zone.

Season of 1906 (March 31, to June 30).

The quarantine service was commenced at this port March 31, 1906, and all shipping interests were notified.

No infectious or contagious diseases have appeared since the one case of yellow fever reported February 21, 1906, and the source of infection in this case has not been definitely established.

The Isthmian Canal Commission has a sanitary corps at this port. The Panama Government has given out a contract for putting in sewers, building a sea wall, and raising the grade of the town. This will be a great help in eradicating the breeding places of mosquitoes. It is hoped to have this work completed in about six months.

Transactions: Vessels inspected and fumigated, 49; ships' crews inspected, 1,390.

No passengers have been allowed to embark from this port on a fruit vessel bound to a southern port in the United tSates.

Concerning Bocas del Toro, Panama, Surg. J. H. White, in his report of February 19, 1906, states:

We arrived at Bocas del Toro on the morning of the 29th and spent the day in inspecting all parts of the town in the same manner as was done at Port Limon. The streets here are, from an esthetic standpoint, atrocious, but the very fact that they are daily flooded by the rise of the tide is in itself a guarantee that the ground water of the city will not breed the stegomyia mosquito, and that the sanitary condition is more apparently bad than really so. The buildings, all of wood, are, however, as in the case of Port Limon, of such a

character as to present no great difficulty in the destruction of the mosquitoes should that become necessary. The town, built on the southern end of Columbus Island, is practically all below high water, but this, as will be shown later, will be remedied.

One serious difficulty in the proper sanitation of this place is the fact that its population of some 5,000 people, including those upon the near-by islands—considered as a part of the town—must, of necessity depend upon cistern water, no other supply being possibly available, and it is doubtful if any sanitary regulations will enforce the screening of these cisterns in a proper manner. At the present time the only sanitary work which has been accomplished has been in the direction of oiling cisterns and rain barrels, which work was done by the United Fruit Company for its own protection. This company is under a contract with the governor of Bocas to raise the general ground level of the town some 4 feet and put in a system of sewers to be flushed by the tide, thus making a clean and dry area of the whole of the inhabited portion of the place.

The hospital of the United Fruit Company is located on Nances Key, an island about 3 miles from the town, and is provided with everything that is necessary for the treatment of disease of any sort, with the exception that here, as in Port Limon, the screening is not effective on account of the coarseness of the mesh—14—but I am assured that it is the desire to comply with every wish of the Service, and having expressed the opinion that 18 mesh should be substituted, I obtained the promise of the manager of the company that this will be done. The hospital is ideally located, and there can hardly be a possibility of infection spreading from it to any other human habitation. In fact, this was demonstrated last summer, when several cases believed to be yellow fever were treated in this hospital.

Stegomyæ were found by three members of our party, both on the hospital island and on Columbus Island, the site of Bocas, and Doctor Swigart, the surgeon in charge of the fruit company's hospital, informed me on my first meeting him that he had found them in the cup-like junction point of the leaf and stem of the cocoanut tree.

I have succeeded in obtaining a map of the town of Bocas del Toro, showing the proposed improvements, and have also obtained other valuable information from Mr. C. H. Ellis, manager of the United Fruit Company, of its intention to ascertain whether an artesian supply of water may not be available for the town, thus doing away with the necessity for cisterns, as in the case of Port Limon. I am also informed that it is the intention of the company to cease the loading of its vessels at the town of Bocas, but to do so at the mouth of the Changuinola River, some 7 miles distant, in the open country, far away from any human habitation, thus still further reducing the risk of infecting these vessels should Bocas itself become infected.

It is supposed that the inspectors at the different fruit ports will keep the Bureau posted regarding these improvements as they are made from time to time, but I will, nevertheless, endeavor to keep sufficiently in touch with these matters to make report thereon in event the inspectors fail to do so.

Passed Asst. Surg. Edward Francis, in his report of February 20, 1906, states, with regard to Bocas del Toro, as follows:

At Bocas del Toro, Republic of Panama, we found a town of 4,000 people living in houses propped up out of the swamp, drinking rain water from barrels which at the same time were breeding Stegomyia fasciata, giving sufficient evidence that she had yellow fever in the summer of 1905, providing no hospital for the town's sick and carrying out no quarantine regulations against her neighbors. Fortunately, from a yellow-fever standpoint, there are no docks, and the ships must load from lighters at a distance of a half mile off shore. There is free communication between Bocas and the Changuinola River, on the banks of which there are very fine banana plantations, one of which is owned by Mr. J. M. Keyes, on whose plantation alone there are employed about 4,000 Jamaica negroes.

It is seen that this plantation quarters a population equal in numbers to that of the town of Bocas del Toro, and for this reason the United Fruit Company maintain a hospital of thirty beds, under the direction of Doctor Wilson, on the banks of this river. This hospital is screened, but the mesh is considerably less than 18 wires to the inch. Stegomyia larvæ were found in the rain barrels near the hospital.

The hospital of the United Fruit Company in Bocas del Toro has an ideal location on an island about 5 miles from Bocas, and is under the management of Dr. R. E. Swigart, the company's surgeon.

The hospital is large, is provided with a good dispensary, and is equipped with everything necessary.

The rooms for yellow-fever patients are screened with wire of insufficiently close mesh, and stegomyiæ were found breeding in the rain barrels of the negro houses close to the hospital.

Within the next year we expect to see the sanitary condition of Bocas very much improved.

The United Fruit Company has a contract with the Government to complete the building of a sea wall around the city, and then to pump in sand and raise the level of the entire city. The company will put in a sewerage system and install a water supply.

At a conference held in Panama, Republic of Panama, January 31, 1906, President Amador, Mr. Ellis, Colonel Gorgas, Doctor White, Doctor Goldthwaite, Doctor Thomas, and myself, discussed the lack of sanitation in Bocas del Toro, and the President expressed his great willingness to give to an officer of the Public Health and Marine-Hospital Service full authority as city health officer and quarantine officer at Bocas del Toro, provided the Surgeon-General saw fit to detail one of his officers for that purpose.

DOMESTIC QUARANTINE.

Under this head are given herewith an account of the Service operations in New Orleans, and other parts of the South in the suppression of yellow fever, reports from the 32 maritime quarantine stations conducted by the Service, statements as to the Texas-Mexican border quarantine, a note regarding dengue in its relation to yellow fever, and mention of Service aid in the quarantining of smallpox.

An account is also given of a special conference in April last with southern quarantine officers, and in conclusion there is given the text of the national quarantine law passed at the last session of Congress and approved by the President June 19, 1906.

YELLOW FEVER IN NEW ORLEANS, LA., IN 1905.

On July 18, 1905, Surg. A. C. Smith, in charge of the marine hospital at New Orleans, wired the Bureau as follows:

Rumors yellow fever New Orleans. Can learn nothing definite. Letter follows.

He was immediately ordered to make investigation and keep the Bureau informed.

From subsequent reports it appears that on the same afternoon he endeavored to get information from the local health authorities, but obtained nothing definite, and on the next day, the 19th, he made a like effort with the president of the State board of health, who gave him no definite information, nor was he able to see any of the suspicious cases.

On the 19th the Bureau received a telegram from the president of the State board of health, as follows:

Look for letter by to-day's mail.

On July 20 and 21 telegrams from Surgeon Smith left no doubt as to the presence of yellow fever, and early in the morning of July 21 Surg. J. H. White, in charge of the marine hospital at Mobile, Ala., was ordered to New Orleans to make further investigation and put

himself in communication with the State health authorities and local board of health.

The president of the State board of health wired the Bureau July 21 that there would be an autopsy the following morning, but in the meantime, on the same date, two cases had been pronounced yellow fever by Surgeon White and health authorities from Mobile.

On the 22d telegrams were received confirming the diagnosis by post-mortem examination.

On the 21st the letter from the president of the State board of health arrived, containing the following statement:

A few cases presenting symptoms of yellow fever have come to my knowledge here. The cases are all in the same neighborhood—about two or three blocks. An autopsy will be held at the first opportunity. In the meantime the city health officer is taking all the necessary steps to destroy the mosquitoes in the localities.

Immediately on receipt of this information it was communicated by telegraph to the State and local authorities of Florida, Alabama, Mobile, Mississippi, and Texas, with a warning to investigate all cases of fever in their localities, to advise screening the cases until the establishment of diagnosis, and requesting prompt report to the Bureau. They were informed that experienced officers of the Service were at New Orleans to investigate conditions.

To the president of the Louisiana State board of health the following telegram was sent on the same date:

White ordered to New Orleans to confer with yourself and local health authorities and look into situation. Please extend him every facility. Suggest screening all fever cases until diagnosis made, as well as destruction of mosquitoes in suspected localities.

In accordance with international agreement, notification was sent by wire on July 22 to the presidents of the superior boards of health of Mexico and Cuba.

The outbreak occurred in the neighborhood of the French Market, in a small district of the city inhabited principally by Italians, many of whom were stevedores who worked on the cargoes of fruit vessels. How the disease obtained admission and how long it had been existing before its announcement have been subjects of inquiry without definite results being obtained by the Bureau. It is obvious, however, that it must have been in existence some weeks, the character of the population among which it appeared permitting the more readily its concealment.

The status of the Service officers sent to New Orleans was as follows: Under the quarantine law of 1893 they were to observe the operations of the State and local authorities and to see that the Treasury regulations (interstate) were being enforced. At the same time, under the provisions of the epidemic appropriation annually made by Congress, they were to assist the State and local authorities in the suppression of the disease.

The State and local authorities cordially received the officers of the Service, and realizing the gravity of the situation on July 22 the Bureau ordered Surgeon Guiteras from Cairo, Ill., Passed Assistant Surgeon Richardson from Savannah, Ga., and Passed Assistant Surgeon Corput from the marine hospital at New Orleans to report to Surgeon White for duty in connection with the outbreak.

All these officers had had large previous experience with yellow fever.

Surgeon Smith was retained at the marine hospital for the conduct of that institution and such other help as he might be able to give in the epidemic.

From July 21 to 26 there were officially reported 73 cases and 22 deaths.

About this time, July 23 and 24, Surgeon White reported that the local authorities conceded the existence of over 100 cases; that the cases were of a virulent type; there were new foci being found outside of the original area, and further expressed the fear that time was being lost in effecting the city organization to do effective work; that the authorities of Louisiana, Texas, and Alabama had requested the establishment of detention camps on the four railroads leading out of New Orleans and as near the city as possible; that he was in conference with State and local health authorities and the governor of Louisiana, and that entire harmony prevailed. He was authorized to open four small camps at Kenner, Avondale, Waveland, and Slidell, respectively, using the camp equipage stored at the old camp at Fontainebleau, and to nominate and place on duty competent acting assistant surgeons for conducting the same. As to measures going on in the city, Surgeon White stated that attempt was being made to disinfect the rooms occupied by suspicious cases, to screen the rooms, and to oil cisterns; that the work was not very effective, but that he would cooperate in endeavoring to make it more so.

He was directed to institute a quarantine inspection of all steamers leaving New Orleans for ports on the Mississippi River and Lakes Borgne and Pontchartrain, the Bureau having in mind the protection of the towns on the Mississippi River.

At the same time a train-inspection service was inaugurated, the details of which were left to Passed Asst. Surg. G. B. Young, ordered from the marine hospital at Chicago, Ill., to Jackson, Miss.; Dr. J. F. Hunter, the secretary of the State board of health of Mississippi, and Surgeon White at New Orleans.

With regard to freight, Surgeon White was authorized to fumigate freight cars destined for the State of Texas, with the understanding that there would be no disinfection of freight itself, the fumigation of cars being for the destruction of mosquitoes therein.

By July 26 the city authorities had agreed to place immediately on duty 19 crews of 5 men each, 7 crews for oiling cisterns and gutters, 7 for fumigating, 4 for screening, and 1 for constructing screens, and announced their intention to gradually increase the force to 150 men, the work to be done by wards and precincts, with foremen, precinct chiefs, and the necessary inspectors.

On July 28 the State board of health declared the entire State to be quarantined against the city of New Orleans, with the exception of the following parishes and towns, which desired to be considered as within the quarantine lines, viz: Parishes of St. Tammany, Placquemine, St. Bernard, and Jefferson, and the towns of Pontachoula and Hammond in the parish of Tangipahoa. The situation in New Orleans about this time is indicated by the number of cases and deaths reported for the period July 21 to August 3, namely, 308 cases and 59 deaths. The day-to-day increase of the fever is set forth in

the statistical tables connected with the report of the division of sanitary reports and statistics.

On August 4 Surgeon White telegraphed the Bureau as follows:

Meeting of business organizations, committee parish medical society, city health officer, and prominent citizens, with only one dissenting voice, have asked governor to request Federal control to stamp out disease. Governor has phoned Souchon that he will wire President immediately, requesting this. Citizens have raised large fund and promise to raise more. Amount not yet definitely settled.

In reply to the above, a dispatch was sent to Doctor White requesting an estimate from him as to the number of commissioned officers it would be necessary to detail, and the number of acting assistant surgeons to be employed, and further requesting a statement as to his contemplated plan and scope of operations if the National Government should act affirmatively.

To this he replied as follows:

Work offered Service is total control of eradication in city. My plan involves districting of city with organization for oiling, screening, fumigating in each district, under separate commissioned officers, of all infected vicinities, 17 wards in city each making fairly convenient district and being as large as one officer can handle. Those already here are overworked trying to guide operations of several hundred men and 14 doctors. Infection is widely scattered and beginning to attack native population. Will need 20 officers and probably as many acting assistants to control about 600 or more men. The total expense for the eradication will be about $1,500, and perhaps $2,000 per day, and if not grappled with immediately it will get beyond the latter. Look up the daily record of seventy-eight.

On August 5, the following telegram was sent Surgeon White from the Bureau:

In your telegram of August 4 you state that the citizens have already raised large fund and promise to raise more, though amount not definitely settled. It is very important that this matter be settled before definite action be taken. Your second telegram of August 4 estimates total expense for eradication at $1,500 or perhaps $2,000 per day. You do not state whether this amount is expected of the Service. Bureau estimates for 40 officers, mentioned by you as being required, would be about $500 per day. The epidemic fund will not permit of $1,500 to $2,000 per day. This is absolute. Bureau would be willing to give you all officers necessary, but the labor and material should be furnished by the city, as has been done before. Wire promptly whether this arrangement can be effected that I may give my opinion to the President. Attention should be called to the fact that the Government is now maintaining detention camps in the interest of New Orleans, and expenses must be met for interstate measures. Rush answer.

Another telegram was sent Surgeon White on August 5, as follows:

President has transmitted to me the request of Governor Blanchard, forwarding resolutions passed in New Orleans, with request to take every step in my power to meet the situation. Concerning the financial situation I wired you this forenoon. The resolutions state that the hearty cooperation of the State and city health authorities, medical societies, and of the merchants and people generally is pledged in such action as may be taken by the Government. In considering Service control there should be some definite written agreement as to the aid of State and city governments, particularly the city government, including all its branches. It is the intention of the Bureau, if matter is taken up, to put you in charge, and necessary to start under fair conditions in order to succeed. Bureau has not yet received any recommendation from you in the matter, and would be glad to have it. Would not a city ordinance be needed?

August 6, the following telegram was received at the Bureau:

The citizens of New Orleans pledge themselves to secure and furnish the funds necessary to pay the expenses which your Service may incur for labor and material in dealing with the situation here, in accordance with Doctor White's telegram to you.

MARTIN BEHRMAN, *Mayor*,
CHARLES JANVIER,
WILLIAM ADLER,
GUS LEHMAN, Sr.,
W. G. TEBAULT,
Citizens' Committee.

August 6, from Surgeon White, New Orleans, the following two telegrams were received:

Citizens' conference wires to-day that if you furnish the officers they will furnish three thousand per day if it be needed. They begin with sixty odd thousand in hand and can easily raise the rest. They give us authority to discharge and employ, and in no way tie our hands. No offer could be more frank, and I recommend that we accept the trust at the earliest possible moment, because time is extremely valuable.

Funds promised for work by bankers, merchants, and mayor will be disbursed by Colonel Janvier, and rolls kept under his orders. Mayor verbally promises in open conference to supplement, if need be, and to give full police authority. Is the committee telegram to you, signed by mayor and several representative wealthy men, sufficient written agreement? City ordinances, including one recently passed, are sufficient.

August 6, the following telegrams were sent to Surgeon White:

Telegrams from yourself and Mayor Behrman and others, members of citizens' committee, received. Take charge at once. Will wire the committee to-morrow. Have ordered the following officers to report to you: Blue, Greene, McMullen, Currie, Rucker, Steger, Smith, and Sweet.

In the meantime the following telegrams were received from and sent to the President:

OYSTER BAY, N. Y., *August 4, 1905.*

Surg. Gen. WALTER WYMAN,
Public Health and Marine-Hospital Service, Washington, D. C.:

Have received the following telegram from Governor Blanchard, of Louisiana:

"At a joint meeting of representatives of all commercial bodies of the city of New Orleans and other prominent citizens, at which were present the mayor of the city, the State and city health authorities, and the president of the New Orleans Parish Medical Association, the following resolution was adopted:

"'That this meeting indorse proposition to ask United States Government to take control of the yellow-fever situation in New Orleans, and the governor of the State and mayor of the city be requested to take immediate steps to carry this proposition into effect; further,

"'That the hearty cooperation of the State and city government and the State and city health boards and the parish medical societies and of the merchants and people generally be pledged in such action as may be taken by the Government.'

"I am requested by the mayor of the city, the presidents of the State and city health boards, and by a committee of prominent citizens to transmit the above resolution to you and request you to take over, on behalf of the Federal Government, through the proper channels, the yellow-fever situation at New Orleans. This I now do, and urge speedy action on your part.

"N. C. BLANCHARD, *Governor of Louisiana.*"

Please take every step in your power to meet the situation at New Orleans and comply with the request of the governor and the other authorities, and notify me what further action is advisable and possible for the Federal authorities to take. Would like full report from you as to what should be done. Please confer with surgeon-generals of Army and Navy, if in your judgment this is wise.

THEODORE ROOSEVELT.

AUGUST 4, 1905.

The PRESIDENT,
Oyster Bay, N. Y.:

Your telegram received, and instructions will be promptly obeyed. I had information this afternoon that the governor's request might be made, and have already wired Service surgeon in New Orleans for certain facts in anticipation of this request. Will wire you full report to-morrow.

WALTER WYMAN, *Surgeon-General.*

AUGUST 5, 1905.

The PRESIDENT,
Oyster Bay, Long Island, N. Y.:

Replying further to your telegram of 4th, submit following report: Service has had skilled officers in New Orleans since first knowledge of the fever. Under the law they are there to see that the Treasury interstate quarantine regulations are enforced, and under the same law to offer assistance in their enforcement. Detention camps have been established and are in operation to permit exit of people without endangering other States, and train inspectors are placed by the Service on all trains leaving New Orleans. Our skilled officers in New Orleans have been and are materially aiding the local authorities in the suppression of the disease. Before formally assuming charge, in accordance with your request, I have deemed it necessary to have an understanding as to expenses. Surgeon White in his telegram to-day estimates the same at $1,500 to $2,000 per day. The epidemic fund will not stand this expenditure. I have wired Surgeon White arrangement desired is that Government should maintain and pay for medical and executive control, but the expense for material and labor of cleaning up the city should be borne by the city itself. This has been the rule heretofore. I am proceeding on these lines. Will report further.

WYMAN, *Surgeon-General.*

AUGUST 6, 1905.

The PRESIDENT,
Oyster Bay, Long Island, N. Y.:

Mayor Behrman and other members of citizens' committee in New Orleans have wired assurance of funds necessary to pay expenses of labor and material. Have wired Surgeon White to take charge immediately, and have ordered large additional force of commissioned officers who have had special experience in epidemic work. The Service appreciates its responsibility, but will go to work with a feeling of confidence.

WALTER WYMAN, *Surgeon-General.*

Immediately on the Service assuming charge in New Orleans commissioned officers of the Service were hurried to that point from their various stations, the places of these officers being supplied temporarily by the appointment of temporary acting assistant surgeons. This illustrates the flexibility of the corps in emergencies, experienced officers being detailed to meet the emergency, their ordinary duties being fulfilled by temporary appointments.

Altogether there were sent to New Orleans 24 commissioned officers, 2 of whom, however, were connected with the hygienic laboratory, and were detailed to make certain scientific investigations into the nature of yellow fever.

Three of these officers contracted yellow fever and recovered.

As shown in the report of Surgeon White, the city was divided into 16 wards and a commissioned officer placed in charge of each, except in one or two instances where acting assistant surgeons were so placed, with headquarters in the ward. Surgeon White established a central headquarters, to which reports were made and from which general orders were given.

A large force of inspectors was employed, and the volunteer work under the Rev. Dr. Beverley Warner and others was effective and performed with great energy.

Besides the 24 commissioned officers mentioned above the Service employed in New Orleans during the epidemic 28 acting assistant surgeons.

The epidemic was declared over before frost, at about which time, October 26, President Roosevelt visited New Orleans. The United States Weather Bureau reports the first light frost in New Orleans December 4 and the first killing frost December 5.

The total number of cases of yellow fever at New Orleans was 3,404, with 452 deaths.

Surgeon White in his report renders tribute "to the magnificent exhibition of popular patriotism and self-abnegation of the citizens of New Orleans as a whole; to the public-spirited manhood of the governor, the mayor, the chief of police, the police magistrates; to the broad spirit of public duty and strenuous activity of the citizens' committee and the leaders of the ward organizations; to the self-sacrificing devotion and loyalty of the medical profession as a whole, and to the earnest helpfulness of the clergy." He also pays tribute to the "70 young physicians, some regular officers of the Service and some volunteers," who were captains in this campaign.

I deem this a proper place to state that not only in New Orleans was there the greatest harmony of action and cordial feeling between the Service and its officers and the State and municipal officers, but throughout the whole of the South where yellow fever prevailed or where its introduction was threatened there was a marked friendly feeling and one of confidence displayed toward the Service. The harmony of action was notable, and I attribute this largely to the influence of the annual conferences which have been held between the State boards of health and the Public Health and Marine-Hospital Service, as required by section 7 of the act of Congress approved July 1, 1902. Four conferences have been held, largely attended and bringing the Service and the State boards of health into closer relations with one another, developing a greater personal acquaintance, and establishing, consequently, a feeling of respect and confidence which evidently was one of the objects intended to be attained by the wise provisions of this section of the act.

Closely connected with the epidemic in New Orleans was the appearance of the disease in the various parishes of Louisiana. By request of the Bureau daily reports were received from the State board of health with regard to the parishes, and a number of officers of the Service were detailed to investigate, in conjunction with State authorities, as to the existence of the disease, to confirm or otherwise the diagnosis made, and in a number of instances where it was found to exist to advise as to the methods to be taken to prevent its spread.

At a number of cities and towns public meetings were called and addressed by the Service officers with a view to impressing on all the necessity of protection from mosquitoes and their destruction.

In general it may be said that these efforts, conjoined with those of the State and local authorities, were effective in diminishing the area of infection and the number of cases of the fever.

Detailed statement as to number of cases and deaths in the parishes will be found in a previous portion of this report relating to sanitary reports and statistics, pages 53 to 56.

GENERAL MEASURES TO PREVENT THE SPREAD OF YELLOW FEVER.

While New Orleans was the focus upon which was centered the chief attention on account of yellow fever, the Bureau was impressed with its responsibility in preventing a general spread of the disease throughout the South.

As previously shown, train-inspection service was quickly inaugurated to permit through passenger traffic from New Orleans to points in the north or other noninfectible territory, and four detention camps were established in the outskirts of New Orleans to permit egress of persons to any desired locality by providing for their continuous observation during a period of six days to demonstrate their freedom from the infection.

Mention should be also made of the fact that several of the States adjacent to or near Louisiana established border-inspection stations at points where the railroads entered the State. At some of these crossings detention camps were established. The two principal detention camps of the Texas authorities were at Echo, on the Southern Pacific Railroad, and Waskon, near Shreveport.

At the very beginning of the epidemic it became evident that the doctrine of the spread of yellow fever through the mosquito was not popularly accepted, nor even accepted in some instances by those in authority. It became immediately necessary, therefore, to spread this doctrine as widely and in as authoritative a manner as possible. Accordingly, the following circular was prepared and issued July 31. It was intended for use both in places which were actually infected and localities liable to become infected. The Bureau had many requests from these latter localities, anxiously desiring to know what measures they should adopt. One hundred thousand of these circulars were printed, and were distributed first in Louisiana and Mississippi.

By request of the Secretary of the Treasury the Postmaster-General directed that these circulars be sent to every post-office in these two States. Each postmaster received a half dozen, with a circular from the Postmaster-General directing him to display the yellow-fever circular on the bulletin board in his post-office and directing him to give the remaining copies to those interested and asking for them. Later the same course was followed with regard to the States of Texas, Arkansas, Alabama, and Florida.

The circular was copied in its entirety in many Southern newspapers.

After the issue of these circulars many requests were received for the same at the Bureau, and the Bureau has received numerous assurances of the good effect of their distribution.

Following is the circular:

[Circular.]

How to prevent yellow fever—No mosquitoes, no yellow fever.

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
Washington, July 31, 1905.

(NOTE.—The measures herein mentioned were recommended by the Army Medical Board of 1900 and have been indorsed by the American Public Health Association and by the First International Sanitary Convention of American

Republics. They have also been justified by the experiences and observations of the two working parties of Yellow Fever Institute of this Bureau in Veracruz, Mexico, and by the commission of the Pasteur Institute, of Paris, France, operating in Rio de Janeiro, Brazil. The measures have been tested successfully on a large scale in Habana, Cuba, and during the yellow-fever epidemic at Laredo, Tex., in 1903.)

The infection of yellow fever is carried by *mosquitoes*, and by no other means is the fever spread.

Persons take the disease by being bitten by mosquitoes that have previously bitten a yellow-fever patient.

The mosquitoes to become infected must bite a yellow-fever patient during the first three days of his attack. These first three days, therefore, are the most important time for preventing the access of mosquitoes to a fever patient.

It is often difficult to decide during the first three days whether or not a patient has yellow fever; hence the necessity in threatened communities of placing a mosquito bar immediately around every patient who has fever of any kind, and for three days at least.

FACTS ABOUT SCREENING.

1. The netting used should have meshes fine enough to prevent the passage of mosquitoes (at least 18–20 meshes to the inch).
2. It is important to screen the doors and windows of the house. It is doubly important to screen the beds of fever patients.
3. Mosquitoes can bite through mosquito nets when any part of the patient's body is in contact with the netting.
4. Frequent examinations should be made to see that there are no torn places in the netting, or that no mosquitoes have found a lodgment inside.
5. The netting should be well tucked in to keep mosquitoes from entering.
6. If mosquitoes are found within the netting they should be killed inside and not merely driven or shaken out.
7. All cases of fever should be promptly reported to the local health officer. Awaiting his arrival they should be covered with a mosquito bar.

FACTS BEARING ON MOSQUITO DESTRUCTION.

1. Mosquitoes live in the vicinity in which they breed. They do not often fly a long distance.
2. Mosquitoes breed only in water—usually in artificial collections of fresh water.
3. The young mosquito, or wriggler, lives in water at least seven to twelve days.
4. Although the wrigglers live in water, they must come frequently to the surface to breathe.
5. Coal oil on the surface of the water prevents the wrigglers from breathing.
6. Destroy the breeding places and you destroy the mosquitoes.
7. Empty the water from all tubs, buckets, cans, flowerpots, vases, once every forty-eight hours.
8. Fill or drain all pools, ditches, unfilled post holes, and the like.
9. Change regularly every day all water needed in chicken coops, kennels, etc.
10. Treat with coal oil all standing water which can not be screened or drained (1 ounce of oil will cover 15 square feet of surface). The oil does not affect the water for use if the water is drawn from below.
11. Where oil is applied to standing water it must be distributed evenly over the surface.
12. Put fine wire netting over cisterns, wells, and tanks of water in everyday use.
13. Places in which it is undesirable to put oil, such as watering troughs for stock, lily ponds, etc., can be kept free from wrigglers by putting goldfish or minnows.
14. Clean away all weeds, grass, and bushes about ditches, ponds, and other possible places, since these afford a hiding place for the mosquitoes.
15. Clean up vacant lots and back yards of all cans, tins, bottles, and rubbish.
16. First do away with or treat all places where mosquitoes are known to breed and then begin to work on places where they might breed.

17. Inspect, and treat with coal oil, gutters, culverts, ditches, manholes, catching basins, etc., along the roadside. Manhole covers should be screened.

18. Houses should be cleaned of mosquitoes by burning 1 pound of insect powder or 2 pounds of sulphur to 1,000 cubic feet of space. The mosquitoes will fall to the floor and should be collected and burned.

19. Success in mosquito destruction depends upon the cooperation of the members of the entire community.

20. While the infection of yellow fever is carried by a single species of mosquito (the Stegomyia), to insure its destruction it is necessary to destroy all mosquitoes.

In places liable to yellow fever both individuals and communities have an effective method of protecting themselves, as indicated above. Use the mosquito bar at once over all cases of fever until the danger from yellow fever has passed. Destroy all mosquitoes.

WALTER WYMAN, *Surgeon-General.*

On August 17 the following circular was published by the Department, revising the interstate quarantine regulations with regard to yellow fever. The previous regulations were effective, but it was deemed advisable to revise the same and to bring them wholly into accord with the mosquito doctrine of the transmission of yellow fever.

(Circular No. 90.)

Amendments to interstate quarantine regulations.

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
Washington, August 17, 1905.

To medical officers of the Public Health and Marine-Hospital Service, State and local health authorities, and others concerned:

The following amendments are hereby made to the Interstate Quarantine Regulations promulgated by this Department September 27, 1894, said regulations and amendments being in accordance with section 3, act of Congress approved February 15, 1893:

ARTICLE IV—YELLOW FEVER.

Article IV is amended so that the several paragraphs shall read as follows:

1. Localities infected with yellow fever, and localities contiguous thereto, should be depopulated as rapidly and as completely as possible, so far as the same can be safely done, persons from noninfected localities who have not been exposed to infection being allowed to leave without detention. Those who have been exposed or who come from infected localities shall be required to undergo a period of detention and observation of six full days from the date of last exposure in a camp of probation or other designated place.

Articles capable of conveying infection shall not be transported to noninfected localities without disinfection.

2. Persons who have been exposed may be permitted to proceed without detention to localities incapable of becoming infected, and whose authorities are willing to receive them, and after arrangements have been perfected, to the satisfaction of the proper health officer, for their detention in said localities for a period of *six* days from last possible exposure to infection.

3. The suspects who are isolated, as required by paragraph 1, Article III, shall be kept free from all possibility of infection.

4. So far as possible the sick should be removed to a central hospital for treatment, and before removal, en route to and at the hospital, should be screened with mosquito netting to prevent access of mosquitoes.

5. Buildings in which yellow fever has occurred, and localities believed to be infected with said disease, must be disinfected by methods hereinafter provided.

6. As soon as the disease becomes epidemic the railroad trains carrying persons allowed to depart from a city or place infected with yellow fever shall be under medical supervision.

7. Common carriers from the infected districts, or believed to be carrying persons and articles capable of conveying infection, shall be subject to a sani-

tary inspection, and such persons and articles shall not be allowed to proceed, except as provided for by paragraphs 1 and 2.

8. This paragraph is annulled.

ARTICLE V—DISINFECTION—FOR YELLOW FEVER.

Paragraphs 4 and 5 of Article V are hereby annulled and the following substituted therefor:

4. An infected house, apartment, or inclosed space is one containing mosquitoes of the genus Stegomyia fasciata which have become infected by biting a patient suffering with yellow fever during the first three days of the disease. For the destruction of mosquitoes in an infected house, apartment, or inclosed space one or both of the following methods shall be employed:

(*a*) By burning in the room or inclosed space sulphur in the proportion of two (2) pounds per 1,000 cubic feet, the time of exposure to be two (2) hours, and the room or inclosed space to be tightly closed prior to the ignition of the sulphur, or—

(*b*) By burning pyrethrum powder in the proportion of one (1) pound per 1,000 cubic feet, the time of exposure to be two (2) hours, and the room or inclosed space to be tightly closed prior to the ignition of the powder. In the employment of this method it should be borne in mind that the smoke of pyrethrum is simply stupefying to the mosquitoes, and at the conclusion of the process the insects should be swept up and burned.

5. All weeds, grass, and bushes around premises infected with yellow fever must be removed, since they afford hiding places for mosquitoes, and all receptacles which may contain water must be removed, oiled, screened, or frequently emptied, as they attract and furnish breeding places for these insects.

LESLIE M. SHAW, *Secretary.*

For the information of health officers and others the Bureau freely distributed copies of a supplement to the Public Health Reports of November 13, 1903, showing by chart and text the geographical distribution of the yellow-fever mosquito, prepared by Dr. L. O. Howard, chief entomologist of the Department of Agriculture and consulting entomologist of the Public Health and Marine-Hospital Service. The article had been prepared by request and published in anticipation of such an emergency as the present. A revised edition was also published, showing an additional number of definite localities in which the Stegomyia fasciata has been discovered since the first issue.

In response to special inquiries from railroad authorities and others, the Bureau also promulgated in August, through the Public Health Reports, the following plain statement covering the restrictions upon travel and defining in specific terms the infectible territory:

YELLOW FEVER—THE INFECTIBLE TERRITORY.

The Interstate Quarantine Regulations of the Treasury Department require that no person leaving a locality infected with yellow fever shall go to any place in infectible territory until said person has been away from the infected locality for a period of six full days. To permit this travel, detention camps are established, in which, under careful observation, travelers may live out this period of six days, when certificates are given them and they are allowed to go where they will. Persons not desiring to avail themselves of the detention camps are allowed to leave infected localities under medical surveillance and proceed continuously to noninfectible territory.

Persons from infected territory passing through to points in the North will not be allowed under the regulations to return into infectible territory until after the expiration of six days from date of their departure from infected localities.

Generally speaking, the infectible territory is the territory which is the habitat of the yellow-fever-bearing mosquito, the Stegomyia fasciata, and, broadly stated, is that part of the United States south of a line drawn from the

Atlantic coast through Washington to St. Louis, Mo., and thence to El Paso, Tex., the excepted portions being given in the subjoined text. This infectible territory is described in Supplement to Public Health Reports of November 13, 1903, in an article by Dr. L. O. Howard, consulting entomologist of the Public Health and Marine-Hospital Service, with a map showing the same.

For the sake of ready reference, the infectible territory is herewith described, being given by States in alphabetical order:

Alabama.—The entire State, with the exception of a small part of the northeastern portion lying east and north of a line passing in a curve through Huntsville and Anniston, Ala.

Arkansas.—The entire State, with the exception of the northwestern half of Benton County.

Florida.—The entire State.

Georgia.—The southern portion of the State, the noninfectible portion being that part of the State lying north of a line passing in a curve through Anniston, Ala., Atlanta, Ga., and Greenville, S. C.

Illinois.—That portion of the State south of a line drawn from east St. Louis, Ill., to Vincennese, Ind.

Indian Territory.—The entire Territory.

Kentucky.—That portion of the State lying west of the Cumberland River.

Louisiana.—The entire State.

Mississippi.—The entire State.

North Carolina.—That portion of the State lying east and south of a line passing in a curve through Atlanta, Ga., Greenville, S. C., Charlotte, N. C., and continued through Lynchburg, Va.

Oklahoma.—The eastern half of the Territory.

South Carolina.—That portion of the State lying east and south of a curved line passing through Atlanta, Ga., Greenville, S. C., and Charlotte, N. C.

Tennessee.—That portion of the State lying west of the Tennessee River.

Texas.—That portion of the State lying east of the prolongation southward of the eastern boundary of the Indian Territory and an undetermined area of the western portion of the State along the Rio Grande.

Virginia.—That portion of the State lying east and south of a line passing through Charlotte, N. C., Lynchburg, Va., and continued in a northeasterly direction through Charlottesville and Alexandria, Va.

THE INTERSTATE SHIPMENT OF TROPICAL FRUIT FROM PORTS INFECTED WITH YELLOW FEVER.

On August 9 the Bureau received a telegram from the secretary of the State board of health of Illinois requesting advice as to the admission into the State of carloads of bananas from New Orleans, stating that citizens were protesting against the admission, and that large numbers of stegomyia mosquitoes had been found at Cairo, Ill., in both empty and loaded banana cars.

On August 10 Doctor Egan, the secretary of the State board, was informed that there was a possibility of such cars conveying infected mosquitoes and that the Bureau was engaged in an investigation of the facts.

On August 11 Surgeon White, at New Orleans, was directed to prevent the shipment of cargoes of bananas from New Orleans into infectible territory, and notice of this order was extended to the State health officers of Mississippi, Tennessee, Arkansas, and Florida, it being stated that the prohibition applied only to shipments from actually infected cities and that there were no restrictions against shipments from other southern ports. In the meantime it came to the attention of the Bureau that the State of Arkansas had forbidden the passage of banana trains through the State, even when destined to noninfectible points. A conference was held at the Bureau with representatives of the various fruit companies, and an arrangement was arrived at whereby it was agreed that the

fruit cargoes should be unloaded at a point below the city, should be discharged into screened refrigerator cars, and that these cars should be taken around and not through the city, and should be transported, with seals unbroken, to points beyond the infectible area before the cars were opened for re-icing. The full text of the agreement, as conveyed in a Bureau letter to Surgeon White, follows:

SIR: Bureau telegram to you of 15th instant, as below, is hereby confirmed: "Following arrangement has been agreed to with Mr. Ellis, manager United Fruit Company. You are directed to nominate acting assistant surgeon for this duty alone, five dollars per day, and direct him to carefully inspect laborers before permitting them to take the barge or other vessel carrying them to Chalmette, and to reject any whom he may have reason to believe suffering with any fever. Important to prevent Chalmette becoming infected. Arrange details for proper sealing with your acting assistant. Agreement: Fruit vessels to discharge at Chalmette. Fruit cars shall be refrigerator cars only, which are tightly closed cars. The ventilators in the roofs shall be covered with eighteen to twenty inch mesh wire gauze. This arrangement relates to four or five vessels in the fruit trade, and they will arrive at the rate of two or three a week at Chalmette. The cargo is taken from fruit vessels to cars by laborers, who will be taken to Chalmette in barges. There will be about one hundred and fifty to two hundred laborers, who will be inspected before going down by an officer of the Service, who will go down at same time and remain to see cars loaded and that the provisions above mentioned have been carried out with regard to screening, etc. This officer will then return. It is understood these cars pass over New Orleans Terminal Company Railroad from Chalmette, which connects with Illinois Central outside the city. In doing this they pass through a noninfected part of New Orleans, being the suburbs of the northeast section. There will be a seal of the Public Health and Marine-Hospital Service attached to each car. These cars will remain sealed as to doors and screened as to ventilators, and the seals will not be broken nor screens removed at any point south of a line drawn from Washington to St. Louis and from St. Louis to El Paso, Texas, it being understood that St. Louis is south of this line."

The Bureau particularly directs that the Service officer in charge of this work shall take every possible precaution to keep the interior of these cars free from mosquitoes.

Early in the epidemic it became evident that passengers from infected places going to Atlanta, Ga., which was open to their reception, could there take passage by train for noninfected points within the infectible territory of the United States. To prevent this Surg. C. P. Wertenbaker was stationed at Atlanta, Ga., to issue certificates to intending passengers by railroad, and to satisfy himself that no passenger from an infected area embarked for a southern point until he had been away from last exposure to infection for a period of at least five days. About 8,000 passengers were thus inspected and certified.

About the same time it was evident that passengers from the infected territory were coming north, disembarking at Norfolk, Portsmouth, or Newport News, and remaining there or immediately taking passage by train for points in the Southern States. Accordingly Surgeon Sawtelle was detailed to visit the cities of Norfolk, Portsmouth, Newport News, and Richmond to confer with the several State and municipal authorities and advise with them regarding their own protection. A steamboat and train inspection service was maintained, partly by the local authorities and partly by the Service.

Previous mention has been made of the train-inspection service throughout the Mississippi Valley under the general supervision of Surg. G. B. Young and the inspection of steamboats leaving New

Orleans for points up the river. To this was supplemented an inspection of steamers at various points along the river.

To prevent the spread of yellow fever from New Orleans by water along the Gulf coast a water patrol was established by Surg. Eugene Wasdin, with headquarters at Gulfport. A number of private launches were at first rented, and subsequently a number of revenue cutters were detailed for patrol duty by Department orders under the immediate oversight of the chief of the Revenue-Cutter Service, Capt. W. G. Ross. This patrol duty was subsequently extended to the mouth of Mobile Bay and to Pensacola. The Bureau desires to acknowledge the valuable aid rendered by the Revenue-Cutter Service.

Extracts from the reports of the several officers engaged in the foregoing interstate quarantine work are submitted herewith, giving briefly interesting details connected with their services. Following, also, may be found interesting accounts by officers engaged in expert investigations in localities where the diagnosis of yellow fever was in dispute or where expert advice was needed as to measures to be taken.

It may be fairly claimed that the operations connected with interstate quarantine were effective in preventing the spread of the disease, for although subsequent to the announcement of yellow fever at New Orleans the disease appeared in epidemic form at Gulfport, Natchez, and Vicksburg, in Miss., and Pensacola, Fla., investigation showed that the fever was introduced into these places from New Orleans before the announcement of the disease in that city, and therefore before interstate quarantine regulations were put into effect.

The record of transactions in Gulfport, Natchez, Vicksburg, and Pensacola are given in the summarized reports from the officers in charge, to which attention is especially invited. The difficulties encountered in enforcing the necessary health measures, the persistence of effort, and the sturdy reliance upon their scientific knowledge of the disease on the part of these officers, their successful efforts in gaining the confidence of the people and their cooperation, are chapters of history of yellow fever both instructive and interesting.

The great triumph at New Orleans, under the immediate supervision of Surgeon White, has already established confidence in human mastery of the yellow scourge.

During the progress of the epidemic a day-to-day account of transactions was published weekly in the Public Health Reports, so that in the half-yearly volume, containing weekly reports from June 30 to December 31, may be found details of transactions which it is not deemed necessary to insert here.

EARLY HISTORY OF THE YELLOW-FEVER EPIDEMIC OF 1905 IN NEW ORLEANS, LA.

SUMMARY OF REPORT MADE BY SURG. A. C. SMITH.

The fever, whatever its origin may have been, gained its first headway in a small section of the city in the immediate vicinity of the French Market, among a population consisting almost entirely of Italians, and at the time the knowledge of its existence became public had apparently only begun to appear in other parts of the city. Such a population lives very much to itself, speaks its own language, and rarely seeks aid or sympathy for its woes outside its

own circle. It was possible, therefore, for a good many cases of the disease to occur before it excited general remark or infected the English-speaking population; and, although the section of the city in which this Italian population lives lies near to the wharves and shipping, no case was received at the Marine Hospital until well along in August.

On the morning of July 18 Acting Assistant Surgeon Scott informed me that he had heard, through a nonmedical man who had acquaintances among the Italian population, that a good many cases of disease and deaths had occurred in a certain block bounded by Decatur, Chartres, Ursulines, and St. Philip streets, and that there was talk that it was yellow fever. Doctor Scott had not seen a case himself nor had he received any intimation from any physician that there was yellow fever in the city. The same afternoon I took a walk through the part of the city described, accompanied by Passed Assistant Surgeon Corput, then stationed at the hospital. We saw a death notice on a door post and approached to read it, and as we did so a woman standing by volunteered to say that the man had died of yellow fever. She said that he was "yellow, yellow, yellow" and that he had vomited before he died. Also learned that the city health officer had visited the house. Almost immediately, however, an Italian priest, who, it afterwards developed, was working in conjunction with the city health office, interrupted the conversation and separated us from the woman.

From that moment I was convinced that yellow fever was present, but I found myself face to face with a difficult problem, in view of the peculiar state of affairs in New Orleans at that time, where ordinary sources of information in such an emergency were closed. To one unacquainted with the city of New Orleans and with health matters there it is difficult to appreciate the desire for concealment which existed in that city in relation to yellow fever. By a kind of common consent among the more responsible portions of the population the term yellow fever was never to be used as applied to the locality, and that physician or other individual who would publicly go contrary to this sentiment would have needed to be strongly intrenched in the esteem and confidence of the people.

As soon as I had satisfied myself that the rumors of the existence of the fever were well founded I went immediately to the local health authorities for information. On the afternoon of July 18, after the visit to the vicinity of the French Market, I called on the city health officer, but was unable to obtain from him any confirmation of the rumors or any assistance whatever in investigating them. The health officer admitted that some suspicious cases were under investigation, but said that no diagnosis of yellow fever had been made and that no death had been reported from it. I asked to see the suspicious cases, but did not obtain permission to do so. On the following day I went to the president of the State board of health, but gained no definite information from him, and was still unable on this occasion to get to see any of the suspicious cases of fever.

He showed me a letter, however, which had that day been written to the Bureau, stating that a few cases of disease presenting symptoms of yellow fever had occurred and that precautions were being taken. He stated also that he had telegraphed to the Bureau and that he had written and telegraphed to the health officers of the neighboring States of Texas, Alabama, and Mississippi.

The letter written by the president of the State board of health to the State health officer of Alabama reached that official's office on July 20, and in the morning of July 21 representatives of the health boards of Alabama and the city of Mobile arrived in New Orleans to make an investigation. They were accompanied by Surg. J. H. White, coming from Mobile. The president of the State board of health had previously telephoned me the evening before to meet him at his office that morning, and again by telephone in the morning had stated that something was to be shown, but I missed the appointment through a misunderstanding. Some cases of fever were shown to the Alabama men, and the first public announcement of the existence of yellow fever in New Orleans was made by them that afternoon at a conference held with the local health officials and a number of leading citizens of New Orleans. At that conference several of the New Orleans men made pleas requesting that Mobile and Alabama would withhold quarantine for a time until it could be demonstrated whether conditions required it, but quarantine had already been instituted by Mobile before the conference began. The example set by Mobile was quickly followed by neighboring States and other communities.

On July 22 a necropsy was held at Charity Hospital on the body of a patient who had died of yellow fever, and following it the official announcement by the State board of health of the existence of yellow fever in New Orleans was made.

The afternoon of July 21 I was informed by the president of the State board of health that the Bureau had ordered Surgeon J. H. White to New Orleans to act for the Service in the matter. Surgeon White took charge of the situation the night of the 22d, and my connection with the investigations ceased at that time.

In regard to the date when the fever was first reported to the health officials, two physicians of the highest standing in New Orleans and of wide experience in yellow fever stated sometime after the epidemic was declared that they had each reported positive cases of the disease to the State board of health on July 12.

SERVICE OPERATIONS IN CONNECTION WITH THE EPIDEMIC OF YELLOW FEVER IN NEW ORLEANS.

The following is the report, in part, of Surg. J. H. White:

Having arrived in the city of New Orleans in accordance with Bureau telegram of July 21, I investigated, through the courtesy of one of the prominent physicians of the city, two cases of fever at the Hotel Dieu, on the afternoon of July 21, and definitely determined both of them to be yellow fever. One of the patients was believed to be moribund, and it was thought an autopsy should be had, this being desirable because neither the State nor the city board of health was willing to admit that the disease was yellow fever until an autopsy had been had; this, however, did not obtain for several days.

Returned to Mobile during the night of the 21st and reported the existence of the two cases, together with an opinion that there were many others. This was also evidently the opinion of Dr. Quitman Kohnke, president of the city board of health, as evidenced by his efforts to disinfect the whole of the Italian quarter near the French Market, although he very positively declined to make a definite diagnosis. Doctor Kohnke's efforts at disinfection were directed toward the district bounded by Rampart, St. Anne, Esplanade avenue, and the river.

Returned to the city of New Orleans on the 22d of July, pursuant to Bureau order of that date, and immediately began preparations for detention camps and for instituting a fumigation of freight cars.

Arrangements were made with the Illinois Central Railroad Company to construct a camp near Harrahan Junction, the railroad company agreeing to construct the camp provided the Service would furnish the material. Another camp was established at Avondale, where the lines of the Southern Pacific and Texas and Pacific railroads begin to diverge, at the site occupied by Camp Hutton in 1897 and 1898.

These two camps were intended to be, and were, maintained at the expense of the Service for several weeks.

A third camp, or rather a detention hotel, was arranged for at Slidell, on the New Orleans and Northeastern Railroad, an arrangement being made with a local hotel keeper by which parties could pay their board at this hotel and be under the observation of a Service officer and guards placed there for that purpose.

An offer was made to render to the city and State boards of health such assistance as might be in my power, which offer was accepted and Passed Assistant Surgeons Richardson and Berry, who had meanwhile reported, were assigned to duty in the infected district.

The services of Passed Assistant Surgeon Corput, who was on the ground before either of the other officers, were proffered to and accepted by the State board of health for the investigation of outside points and to assist the local authorities in making a fight against the disease.

Doctors Richardson and Berry made considerable impression on the infected area, where the disease showed signs of abating, about August 4, though spreading rapidly outside of that area.

Requests for the disinfection of mail were made within two or three days after the establishment of Service control, but believing this to be an absurdity, the following telegram was sent to the Bureau:

AUGUST 6, 1905.

SURGEON-GENERAL, *Washington, D. C.:*

Have refused to disinfect any mails, and request Bureau indorsement of this attitude.

WHITE.

And the following answer received from the Bureau:

WASHINGTON, D. C., *August 7, 1905.*

SURGEON WHITE, *New Orleans, La.:*

Replying to your telegram (6th), Bureau had already conferred with Post-Office Department and refused to fumigate mail or furnish material.

WYMAN.

Whereupon all parties in interest were notified that no mail would be disinfected, it being deemed unnecessary and likely to confuse the mind of the public as to the real necessities in dealing with yellow fever.

(NOTE.—At about this period the Service, by direction of the President and upon the request of the governor of the State, the mayor of the city, commercial bodies, and prominent citizens assumed charge of the management of the epidemic, as is told elsewhere.—ED.)

A hospital for the isolation of such patients as could be persuaded to enter it was put in operation in an unused building on Dumaine street about July 29, and later a very perfectly arranged hospital was improvised for this purpose from the old McDonogh School on Rampart street, this latter building lending itself most thoroughly to the work, both in its shape and size. It was entirely screened with 18-mesh wire and provided with every comfort.

In this place with the same class of patients the death rate was 50 per cent. lower than in the Dumaine street hospital, because of more cheerful surroundings and because the people were getting less frightened about being diagnosed as yellow-fever patients.

Volunteer ward organizations had been put in operation about July 25, and these were consolidated under the leadership of Rev. Dr. Beverley Warner, rector of Trinity Church. This patriotic body of citizens raised many thousands of dollars in the aggregate, which they applied under the guidance of their leader to the equipment of each ward for screening and oiling cisterns, and later, at my suggestion, for volunteer fumigation. They did all of the supervision and much of the labor involved in this work absolutely without pay, and by contributing largely to the general destruction of the whole genus Stegomyia they are in no small degree entitled to a share in the credit of success. It could hardly have been possible to succeed without the aid of this most public-spirited of organizations.

Their cooperation with the Service was thorough, hearty, and perfect.

The general plan of organization consisted of:

(*a*) A central office located over the Louisiana National Bank.

(*b*) A purveying division on Baronne street.

(*c*) The establishment of, at first, 16 ward headquarters, wards 16 and 17 forming one, with the addition subsequently of subward headquarters in the lower portion of the Ninth ward and on the Algiers side of the river.

The ward headquarters were then provided for by the organization of their respective forces into gangs called:

(*a*) Screening.

(*b*) Pasting and fumigating.

(*c*) Inspection.

(*d*) Salting and oiling.

TRAFFIC ARRANGEMENTS.

The most immediate effort which was made and one productive of great good, and which, fortunately, there was time to do before the work of eradication in the city was placed in the hands of the Service, was provision for the movement of freight and passengers, which was accomplished, first, as to freight by the fumigation of cars, the details of which are as follows:

A superintendent was placed at each freight depot and the railroads provided him with a gang or gangs of three men each, who fumigated each car

with 2 per cent sulphur dioxide for two hours and then sealed the car. Each car was supplied with a placard, under Service seal, showing its number (to prevent fraud) and date of fumigation. No car was allowed to be used without fumigation if it was not loaded in twenty-four hours after sealing. There were employed in this work from 75 to 100 men under 10 superintendents and 1 general superintendent, and during the "hundred days" of the epidemic there were in all 33,565 cars so treated and sent out loaded with freight.

In addition to this a steamboat inspection and disinfection service was instituted on the river and lake fronts to facilitate the movement of freights.

The passenger traffic leaving the city was provided for by relays in the usual manner, no passenger cars being allowed to go outside of the State except on one road, which eception was purposely made, and without damage.

The Louisville and Nashville Railroad Company was allowed to run its cars back and forth across Mississippi, to be traveled in day and night by scores of nonimmune guards and train crews, and despite the fact that these trains ran through what was known as the infected district, not one of these men had fever of any kind.

After the first week Pullman cars were not allowed to come into the city at all, thus avoiding the necessity of fumigating them in order to satisfy public opinion.

CONTROL OF INCOMING PEOPLE.

In previous years it had been deemed necessary, in order to prevent further infection of the city from the outside, to quarantine against other infected points, and this was undoubtedly as rational (or, it should be said, equally as rational) a plan as any other system of land quarantine heretofore in existence.

The idea was conceived that, although there were many areas in the city of considerable extent and fairly dense population untouched by the fever, it would be safe to allow people from infected points, who had their homes or business in the city, to return here, provided they did so under proper precautions, these being that they should possess a certificate to the effect that they had not come from an infected house and were in good health at the time of starting, the fact that they came from an infected town being considered, and subsequently shown to be, of no importance whatever. Some 600 people were so admitted from infected points, their intended addresses being taken by the train inspectors and forwarded to the central office, from whence they were distributed to the various ward headquarters and the persons kept under surveillance until the expiration of six days. Not a single false address was given by, and not a single case of yellow fever developed in, any of these people.

The only cases of yellow fever brought into the city from outside points were either those which were openly brought in by permission to be treated at the emergency hospital, or crept in surreptitiously from infected points contiguous to the city, such as Kenner, Gretna, St. Bernard parish, etc., and even these caused no very great amount of trouble.

DEDUCTIONS TO BE DRAWN FROM THE WORK.

The above facts, undeniable in themselves, point to the broader fact that a hard and fast quarantine need not be maintained against an infected point by cities which are willing to undertake the care of an occasional case of fever. Such generosity of treatment would allay much of the panic incident to an outbreak of yellow fever and in time make it entirely possible to only quarantine the house of the sick until it was disinfected.

SUMMARY.

Population of city	325,000
Total area of the city square miles	196
Area actually occupied do	44
Total number of cases of yellow fever	3,404
Total number of deaths from yellow fever	452
Total number of house-to-house inspections	269,128
Total number of rooms disinfected	55,151
Total number of miles of gutters salted	753
Total number of cisterns screened and oiled	68,000
Total number of cars fumigated (freight)	33,565

Total number of pounds of salt used in gutters	2,998,000
Total number gallons of oil used in cisterns and gutters	67,375
Total number of pounds of sulphur used	448,000
Total number of pounds of pyrethrum used	5,000
Total number of officers employed at one time	73
Total number of men employed at one time	1,323

AN ACCOUNT OF THE SERVICES OF SURG. G. M. GUITERAS IN AND NEAR NEW ORLEANS.

Surgeon Guiteras reports, in part, as follows:

In compliance with official orders from the Bureau, I left Cairo, Ill., July 23, arrived at New Orleans, La., Sunday, July 24, reported to Surg. J. H. White for duty, and was detailed to establish detention camps at convenient points on the principal railroads entering New Orleans, and to manage such camps. In conjunction with the commanding officer, camps were established at Avondale, La., on the Southern Pacific; Slidell, La., on the New Orleans and North Eastern, and Harahan Junction, La., on the Illinois Central. These camps were put in commission on the following dates: Avondale, July 27; Slidell, July 26; "Camp Wyman" (Harahan Junction), August 5. All efforts to establish a detention camp on the Louisville and Nashville Railroad failed on account of the opposition of the people in the neighborhood of the only sites which were available for the purpose. A report of these camps was made to Surgeon White shortly before my departure from New Orleans, and is therefore omitted here.

In addition to the above I was detailed on special diagnostic work, and on this duty used a diagnostic outfit, consisting of a small satchel 10 inches long, containing a rack with six glass bottles with ground-glass stoppers and metal caps. Three of the bottles contained the necessary reagents for the Diazo reaction, one acetic acid, one nitric acid, the sixth was left empty for urine samples. In addition to this the satchel contained test tubes, a metal alcohol lamp, small glass funnel, filter paper, red and blue litmus paper, a graduate, a pipette, a needle, glass slides, cover glasses, and a Tallquist hæmoglobin-scale book.

The fact that it had been determined in Habana by Dr. John Guiteras that the Diazo reaction was in practically all cases absent in yellow fever, and that the hæmoglobin was either normal or above normal, made these tests an important factor in making up the diagnosis in obscure cases. The outfit was compact and handy. It was used with great benefit and success throughout the epidemic.

The detail above referred to covered territory along the line of the Southern Pacific Railroad, and in this connection Patterson, Lafourche Crossing, Rayne, Lafayette, and Schriever, all in Louisiana, were visited. Yellow fever was discovered at all these places except Schriever, but the proper precautions being taken, there was but little spread of the disease in any of them (none at Rayne) except at Patterson, where the disease had gained such a foothold that energetic and united efforts were necessary to control it. Nineteen cases were discovered the day of my first visit.

The work of controlling the disease was undertaken under considerable difficulties, but some headway had been made in that direction at the date of my departure, and it was learned that later on the disease spread rapidly, due probably to the lack of harmony among the inhabitants and the scarcity of funds.

While in Patterson, on August 28, I was relieved from duty under Surgeon White and directed to proceed to Natchez, Miss. On my arrival at Jackson, Miss., en route to Natchez, telegraphic instructions reached me revoking the previous orders and directing me to proceed to Vicksburg, Miss., to investigate cases of yellow fever reported from there and to get in touch with the local health authorities and to act with them in an advisory capacity.

THE YELLOW FEVER AT LAKE PROVIDENCE AND TALLULAH, LA.

Acting Asst. Surg. William Krauss was ordered to proceed from Memphis to Tallulah and Lake Providence, and arrived at the former town on August 10. His services consisted of making sure the diagnosis of yellow fever in both towns, organizing the sanitary work, and visiting small places in the neighborhood of both towns for a like purpose.

There were in all at Tallulah and vicinity, August 14 to October 28, 317 cases and 18 deaths.

The following interesting synopsis of the epidemic in Lake Providence was compiled by Acting Assistant Surgeon Krauss and C. Mahe, secretary of the town organization:

A SYNOPSIS OF THE YELLOW FEVER EPIDEMIC IN LAKE PROVIDENCE, LA., 1905.

The yellow fever was imported into Lake Providence by an Italian woman, Annette De Vincenzi, who, having the fever, fled from New Orleans and came here. She arrived here on July 21, and died from yellow fever on August 4. An inspection was had on August 11, and no cases of yellow fever were found on that date. The first case directly traceable to the original focus was that of Meyer Kauffman, who was taken sick on August 16 in his room next to the shop where the Italian woman stayed the first night she was in Lake Providence. This case was officially diagnosed as yellow fever on August 22; also that of Charley Hall, who was taken sick on the 16th.

The yellow fever epidemic in the town of Lake Providence lasted three months, during which 327 cases were officially reported—80 whites and 248 colored; and 23 deaths occurred—15 whites and 8 colored. Many citizens fled from the town to the country, and three exoduses took place by rail—on August 26, September 8 and 13. On September 20 Doctor Krauss ordered the census of the town to be taken, and the population numbered yet 1,508—455 whites and 1,053 colored. It was then ascertained that 144 colored inhabitants had been ill with some kind of fever and never were reported. Since that time to the end of the epidemic it is estimated that about 50 more escaped the regular inspection. The total number of cases, reported and not reported, is estimated to have been 522, or about one-third of the actual population of the town. This was, of course, in unscreened negro cabins, where no sort of prevention could be practiced.

In the parish of East Carroll the yellow-fever cases were as follows: First Ward, none; Second Ward, 14 cases and 1 death—that of W. H. Benjamin; Third Ward, outside of town, 11 cases; Fourth Ward and Shelburn district. 18 cases and 3 deaths—W. K. Spurlock, J. R. Wheaton, and Brownley; Fifth Ward and Millikin district, 12 cases and no deaths.

By way of comparison, we would like to call your attention to a document in the possession of Mr. Henry L. Deeson, of our town. He has now in his possession a book containing the names of 128 citizens of Lake Providence who died during the epidemic of 1853 from the 2d of September to the 17th of October. He says that about 220 persons only were left in the town at that time, and admitting that all had the fever, which is not likely to have been, then 56 per cent of them died, while this year of the 327 persons who had the fever only 23 died; that is, just a little over 7 per cent of those who were sick.

So much for the discovery of the spreading of the yellow fever by the stegomyia mosquito and the result of a fight directed against it alone without reference to any other mode of spread.

The experience during this epidemic in Lake Providence has been that nonimmunes nursed fatal cases without being stricken so long as they protected themselves from the mosquito bites.

Yellow-fever cases in Lake Providence, La., during the epidemic of 1905.

Date.	New cases.	Deaths.	Date.	New cases.	Deaths.
August 22	2	0	September 24	9	0
24	4	1	25	4	0
25	7	0	26	9	0
26	1	0	27	1	0
27	3	0	28	3	0
28	7	0	29	3	1
29	3	0	30	3	0
30	2	0	October 1	2	0
31	1	0	2	7	0
September 1	2	0	3	6	0
2	1	0	4	5	0
3	3	1	5	3	0
4	9	0	6	1	0
5	20	0	7	6	0
6	9	0	8	3	1
7	7	0	9	3	0
8	9	1	10	4	1
9	5	2	11	3	0
10	11	4	[a] 12	0	1
11	8	1	13	1	0
12	10	0	14	0	0
13	17	3	15	0	0
14	11	1	16	0	0
15	15	0	17	3	0
16	14	0	18	0	0
17	11	0	19	0	0
18	9	2	[b] 20	0	0
19	11	0	[c] 21	0	0
20	8	2	[d] 22	0	0
21	9	0	[e] 23	0	0
22	4	0	24	0	0
23	14	1	Total	327	23

[a] First frost, 44. [b] Temperate, 54. [c] Second frost, 44. [d] Third frost, 40. [e] Fourth frost, 42.

THE EPIDEMIC IN VICKSBURG, MISS.

Surgeon Guiteras reports, in part, as follows:

Arrived in Vicksburg at 4.30 p. m. August 28, 1905. Investigated 2 cases of yellow fever reported by Dr. H. H. Haralson and others, and after a careful examination confirmed the diagnosis in both cases. The patients had been screened under mosquito bars, and one of them was in a screened room. The mesh of the screening material, however, was inadequate to prevent the passage of stegomyia mosquitoes. Within the first week of the campaign 17 cases of yellow fever were reported, all, with one exception, marking a distinct focus. From this it may be inferred that the disease was widely distributed throughout the city at the time the first cases were reported.

ORIGIN OF THE DISEASE.

While it has been impossible to locate the first cases of yellow fever in Vicksburg, the origin of the disease may be clearly established.

On July 18 the Yazoo and Mississippi Valley Railroad ran an excursion from Vicksburg to New Orleans, taking passengers from all points as far as Baton Rouge. About 500 persons, mostly colored, were taken from Vicksburg. The excursion returned from New Orleans on August 20. At the time these excursionists were in New Orleans it is estimated that there existed in that city about 200 cases of yellow fever in the vicinity of the French market, one of the points that most attracts tourists and sight-seers. It would have been strange indeed, if the large number of people carried by this excursion had entirely escaped infection under such circumstances. Evidently they did not, but on the contrary returned to their homes, scattering the infection from Baton Rouge to Vicksburg, infecting both cities and the intervening towns of Port Gibson, Rosetta, Roxie, and Hamburg.

As a majority of the excursionists from Vicksburg were negroes, it is probable that the first cases developed among them, although the clinical history of several cases of illness among the whites, occurring within a few days after the return of the New Orleans excursion, is very suspicious. Doubtless some

of these were yellow fever, although it is impossible to determine this absolutely.

It is a well-known fact that in the negro race yellow fever, as a rule, is of mild type and difficult to diagnose, so that it is natural to suppose that some cases developed among them were not recognized—perhaps not even seen by a physician—and thus the infection was planted in Vicksburg.

The time between the return of the excursion and the diagnosis of the 2 cases of yellow fever on August 30 is sufficient for a secondary infection, and even for a tertiary infection if all the conditions are favorable.

The fact that within one week after the first 2 cases of yellow fever were declared, 17 cases were reported in 16 distinct foci is conclusive evidence that a large number of cases had occurred after the excursion to New Orleans and had escaped detection.

CONDITIONS IN VICKSBURG.

Vicksburg, situated on the banks of a broad canal which carries the waters of the Yazoo River to the Mississippi, with the latter river flowing along the lower limits of the city, is built upon a range of hills with intervening valleys.

The city is traversed by several bayous, the water in some places being practically stagnant. The many hollows between the hills offer opportunities for the formation of pools of standing water.

Good water for drinking and household purposes is supplied by the waterworks company, but notwithstanding this, cisterns are numerous, the majority of which are of the underground variety.

The above conditions, together with the fact that the majority of the streets are unpaved, and in wet weather holes and depressions are filled with standing water, make the city a good breeding place for mosquitoes.

Passed Assistant Surgeon Goldberger, when he visited and inspected Vicksburg a short time previous to the appearance of the first recognized cases of yellow fever, stated that the conditions were all favorable to the propagation of the disease, if it should be introduced. I found that such, indeed, was the case on my arrival.

The Stegomyia fasciata and other mosquitoes were numerous. Few dwellings were screened, and in the majority of those the screening was inefficient, the mesh being too large and the screens ill-fitting.

The financial condition of the city government added to the seriousness of the situation. In debt, and with an empty treasury, no funds were available to inaugurate and carry out proper preventive measures. Fortunately, a citizens' committee of public health had been formed on August 25, whose first purpose had been to secure funds to carry out necessary sanitary measures looking to protecting the city from the threatened infection, but when the disease was declared to exist, this committee offered its financial resources, as well as the time, labor, and intelligence of its members, to stamp out the disease.

For a few days following the announcement of yellow fever in Vicksburg things were in a somewhat chaotic condition, and the work of screening and fumigation was retarded. While I insisted on the importance of beginning systematic work at once, no funds seemed available for the payment of labor or purchase of supplies. The first steps in the proper direction were taken by Dr. H. H. Haralson, representing the State board of health, and shortly afterwards the citizens' committee came forward with the necessary funds.

Two screening and three fumigating crews were then organized and put to work under my supervision. Each fumigating crew was furnished with a wagon containing the necessary equipment, and placed under the direct orders of a medical officer of the Service. Acting Asst. Surgs. B. I. Hicks, J. A. K. Birchett, and H. B. Wilson were detailed for this purpose. These officers were also instructed to see that the screening of fever cases was effective.

HOUSE-TO-HOUSE INSPECTION.

Shortly after arrival I recommended that a house-to-house inspection be made, and the work was promptly and cheerfully undertaken by the citizens' committee under the intelligent supervision of their president, Col. J. J. Hays. It was soon found, however, that under existing circumstances it would be necessary to have this work done under the supervision of five medical inspectors. The city was therefore divided into five districts and an inspector assigned to each. Their work, as well as that of the citizens' committee, was productive of much good, but the efficiency of the inspection was impaired by the strenuous opposition of a local physician.

EMERGENCY HOSPITAL.

Appreciating that one of the first requirements to properly handle the situation was the establishment of an isolation hospital, inquiry was made for a suitable place, and was at once directed to the so-called "pest-house," which had been constructed with a view of isolating smallpox patients, but which had been but little used for that purpose. It was a two-story brick building of recent construction, with all modern conveniences, and which only required to be made mosquito proof to afford an ideal place for the reception and treatment of yellow-fever patients. The hospital was screened under the direction of Doctor Wilson; nurses and attendants employed, and it was ready for business September 7. The work accomplished by the hospital was invaluable, but not so much so as it should have been, for the reason that it was utilized only for such cases as could be prevailed upon to go there; whereas under the circumstances the health authorities should have had the power to remove to the isolation hospital all cases unable to care for themselves, or where the conditions were such that they could not be properly isolated in their own homes.

The emergency hospital was closed October 21.

During this interval a total of 71 cases of all kinds of fever were treated in the institution, with a total of 3 deaths. Twenty-five cases of yellow fever were treated, with but 1 death.

The personnel of the hospital consisted of 1 assistant physician, 3 nurses, and 1 attendant. These and 4 persons held in detention for several days were all nonimmunes. None of them developed yellow fever.

From August 30 to September 9, 22 cases and 3 deaths of yellow fever were reported in Vicksburg. During this period there had existed considerable skepticism among the laity and a few physicians as to the true character of the prevailing disease. There had been much discussion, and, as a consequence, a lack of united effort. This condition of uncertainty, however, was fast disappearing.

The medical society of Warren County, in a well-attended meeting, indorsed the Service position and the work that was being done. The city council, the board of health, the State health officer, the medical profession, and the citizens' committee were all working in harmony with the Service, and the situation seemed promising for an early and complete stamping out of the disease.

At this juncture there appeared a disturbing element upon the scene in the person of a prominent and wealthy physician of Vicksburg, who had been absent from the city, but who returned September 8. Had he thrown his influence in support of the sanitary measures that had been established there is no doubt that the efforts to stamp out the outbreak would have been promptly successful. Unfortunately he did not do so.

ALL CASES OF FEVER SCREENED.

Of all the measures undertaken for the purpose of stamping out the epidemic, one of the most productive of good was the screening of all cases of fever, no matter of what character. A city ordinance required physicians to report all cases of infectious diseases, the diseases covered by the ordinance being specified therein. It was found that this did not accomplish the desired purpose, so, on September 15, an ordinance was passed by the city council requiring that all cases of fever of whatever nature should be reported within twenty-four hours, irrespective of whether the case had come under the cognizance of a physician or one of the laity. Cases so reported were promptly screened, with few exceptions, the only exceptions being those cases where a reliable physician could state positively that the fever was due to some well-defined cause other than infection from yellow fever.

COURSE OF THE EPIDEMIC.

Subsequent to the announcement of the first two cases of yellow fever on August 30, the disease seemed to spread slowly. This was due in part to the fact that the medical profession as a whole had not yet admitted that the prevailing disease was yellow fever and were not so reporting it.

But even when the entire medical fraternity, with one exception, was working in harmony, the increase was slow until the last week in September and first week in October, when the daily number of cases markedly increased, evidently the result of the secondary infection from the unreported cases of the physician

before mentioned. As before stated, he returned to Vicksburg on September 8, so that the marked increase in the number of cases above referred to occurred from fifteen days to four weeks after his arrival.

During the period above mentioned—that is, the end of September and the first week in October—the epidemic reached its height. After October 7 there was a decided decline, and on October 13, the date of the first light frost, the epidemic as such was practically over. The situation was under control. Quite a number of cases were reported subsequent to this date, but they were isolated and never reached epidemic proportions and were unquestionably due to infection from unreported cases. On the 21st of October there were but five cases under treatment. Light frosts had occurred on two or three occasions. The Mississippi State board of health raised the State quarantine against Vicksburg on October 23 and discontinued the services of Dr. H. H. Haralson, the representative of the State board in that city. At the same time the disinfecting forces were reduced to one fumigating and one screening crew. This reduction was made partly on account of the diminished number of cases and partly for the reason that funds were lacking to continue the former force.

I telegraphed to the Bureau under date of October 21, stating that my mission in Vicksburg seemed accomplished and requested orders to rejoin my station.

WORK OF SERVICE.

In accordance with Bureau instructions the Service never assumed control of the situation in Vicksburg, though frequently urged to do so by the local authorities. The conditions were such as not to admit of the Service taking that responsibility. As already stated, the city was without funds, and the expenses of the campaign had to be borne by the voluntary subscriptions of the public and by the uncertain appropriations of the State and the county. At no time was it possible to absolutely guarantee a sufficient sum to cover all expenditures that might arise. Moreover, there was a small though influential group antagonistic to the Service. The conditions were very different from those in New Orleans.

While not in entire control, all those interested in the fight and the people at large looked to the representative of the Service for advice and direction in all matters relative to quarantine, disinfection, or sanitation.

Through the courtesy of Mr. P. M. Harding, the acting mayor, office room in the city hall was offered and accepted. This was preferred to the Public Health and Marine-Hospital Service office in the Government building for the reason that it was more accessible and in closer touch with those engaged in the campaign, especially the police department. In passing, it is desired to say that the police department, under its efficient chief, Capt. William Price, rendered invaluable services throughout the epidemic.

The work of the campaign was directed from the office of the Public Health and Marine-Hospital Service in the city hall. The Service had direct charge of screening, fumigating, and inspecting. Orders for material were issued from this office, and time books of employees kept. All bills were examined, checked, and, when approved, paid by the citizens' committee. Two bulletins giving information relative to the situation were published daily, at 1 p. m. and 6 p. m., respectively.

The oiling and other general sanitary measures were efficiently directed by Col. J. J. Hays, president of the citizens' committee, and Capt. William Curphy, president of the board of supervisors of Warren County, with occasional inspections by me.

The quarantine restrictions imposed by the health authorities of the city of Vicksburg prior to the declaration of yellow fever were excessive and based upon antiquated notions as to the mode of propagation of the disease. The almost absolute ignorance of the people with reference thereto showed that nothing had been learned from the experiences of Habana and Laredo. However, the authorities and the people were willing to learn and to act upon such knowledge as might be imparted by some one authorized to speak upon the subject. After a talk with the people and a few conferences with the city council and health authorities the excessive restrictions were modified so as to correspond with the requirements of the regulations of the Public Health and Marine-Hospital Service.

A board of diagnosticians was created on September 30, with the view of having a body of physicians in whom all classes would have confidence to pass on doubtful cases. The board was composed of the three active and two ex

officio members, as follows: Acting Asst. Surg. R. O'Leary, chairman; Acting Asst. Surg. J. A. K. Birchett, Dr. R. A. Quin, Dr. H. H. Haralson (ex officio), State health officer, and Surg. G. M. Guitéras (ex officio), Public health and Marine-Hospital Service. The board was abolished as no longer necessary on October 13.

The Service force on duty in Vicksburg was as follows: Surg. G. M. Guitéras, in command; Acting Asst. Surg. B. I. Hicks; Acting Asst. Surg. W. H. Wilson; Acting Asst. Surg. J. A. K. Birchett; Acting Asst. Surg. R. O'Leary (temporarily); clerk and stenographer, B. A. Root (from September 5 to October 3, 1905); clerk and stenographer, Miss M. K. McElligott (from October 3 to October 25, 1905).

The expenses to the Service for the above personnel and a few incidental items amounted to about $2,440.25.

The total money expended during the campaign through the citizens' committee, including the appropriations from the State and county of Warren, amounted to $10,051.31. The Federal Government, through the Service, expended $2,440.25, making a total of $12,491.56. It will be noted, therefore, that 19.61 per cent of the total expenditures were borne by the Government through the Service.

The methods employed against the spread of the fever were similar to those used in Laredo, Tex., in 1903 and New Orleans in 1905 and need not be described here. The result of the work was eminently satisfactory.

It must be borne in mind that the disease was widely spread in Vicksburg when the first two cases were recognized and the first preventive measures taken. As before stated, within the first few days 16 foci had been discovered. It must also be remembered that there had been no yellow fever in Vicksburg since 1878, and that in the meantime the population had increased considerably. There was, therefore, a large nonimmune population, and the sanitary condition of the city, as witnessed by Passed Assistant Surgeon Goldberger and myself, favored the spread of the disease.

Despite this and the difficulties before mentioned the epidemic was controlled before frost, and an epidemic that would have reached the proportions of that of 1878 and seriously menaced the adjacent country and neighboring States was kept within bounds and would scarcely have merited to be considered an epidemic had it not been for its general distribution throughout the city.

From August 30 to November 6, 222 cases of yellow fever were reported. The following table gives the race, sex, and mortality:

	Cases.	Deaths.	Mortality.
			Per cent.
White males	78	20	25.64
White females	77	5	6.49
Negro males	38	1	2.63
Negro females	29	0	.....
Total	222	26	11.71

From September 1 to October 24, 1,280 houses containing 5,259 rooms were fumigated. During the same period all cases of yellow fever were screened, and from September 12 all cases of fever of whatever nature with but few exceptions were also screened.

While in Vicksburg I was called upon to investigate suspicious cases in Corinth, Port Gibson, Rosetta, and Greeneville, all in Mississippi. At Corinth, Greeneville, and Rosetta the cases were found not to be yellow fever.

At Rosetta yellow fever was discovered later. The cases, however, had no connection with those first examined. At Port Gibson, an important Mississippi town, the conditions were found sufficiently serious, and it was recommended that a regular officer of the Service be sent there. Passed Asst. Surg. Joseph B. Greene was detailed for the purpose by the Bureau and directed to report. His work was well done and speaks for itself. His report is herewith appended.

GENERAL OBSERVATIONS.

As before stated, with special reference to Vicksburg, it is remarkable how little the doctrine of the transmission of yellow fever has been accepted by the people living in infectible territory, except where it has been brought home to

them through an outbreak of the disease. After the brilliant results obtained in Habana during the American occupation and by the Cuban government subsequent thereto, as also the object lesson of Laredo, Tex., it seems incredible that so little should have been done on scientific lines to make impossible the spread of yellow fever in our southern cities.

Great progress has been made during the past summer in educating the people of infected localities in the principles of the mosquito doctrine of the transmission of yellow fever. Wherever there has been an outbreak of the disease the people have become convinced of the truth of that doctrine. It has been the experience, however, that where the disease has not occurred, and where they have not come in close touch with the active measures undertaken to control or stamp it out, there is still much ignorance and skepticism.

An effort should be made to overcome this by widely distributing pertinent literature on the subject. And as it is reasonable to suppose that in spite of the progress already made and being made to eradicate this disease from tropical and subtropical America, it will continue to harass us for many years to come. It is believed that a campaign of education should be begun with the young. All important facts pertaining to the transmission of yellow fever by the stegomyia fasciata and the mode of propagation of this mosquito should be taught in the public and private schools and colleges in infectible territory. There can be seen in this way a good chance to completely destroy the stegomyia in its present habitat, and even if not successful in entirely destroying it the great advantage would have been gained that when yellow fever should make its appearance in a locality the work of the sanitarian in checking or stamping out the disease would be made easy indeed and the usual panic with its discomforts and financial losses avoided.

Under present conditions the first care of the sanitary officer sent into an infected district is to educate the people and with care and tact convince them that what it is proposed to do is for their good. In doing this, much valuable time and effort is consumed that should be utilized in more important work.

As a rule the people are intelligent and respond readily to the instructions given, but there always remains an intransigent minority who scoff and deride all scientific methods.

It is a mistake to suppose that the present outbreak has completed the education of the people as to the truth of the mode of transmission of yellow fever and the ready means we have at hand to control it. As before stated, outside of infected localities there is yet dense ignorance concerning it, and even in places recently infected there are many unbelievers.

One of the important functions of medical officers of the Service in epidemic times is to conciliate and bring together divergent elements.

When suspicious cases of yellow fever are reported in any locality the medical profession as well as the laity are usually found divided into two antagonistic camps—one holding that it is, the other that it is not yellow fever.

Into this contention all kinds of local prejudices and animosities, personal, social, and political, are injected.

An officer of the Service appearing on the scene trained for this particular work, with no ax to grind and with no connection or interest one way or the other, invariably carries with him the best element of the people and the profession. Not that he is any brighter or more capable than some of the local physicians may be, but that he is under discipline, can look at the situation impartially, and has no interest in local disputes other than to smooth them over and to get everyone together to obtain the results desired.

GOVERNMENT TO MEET INITIAL EXPENSES.

As was the case in Vicksburg the Service officer is usually confronted with a total lack of resources with which to initiate the first necessary sanitary measures. The city, county, and State are usually devoid of funds for this purpose, or valuable time must be consumed in obtaining such financial assistance as they may be able to offer, before the campaign against the infection can be duly commenced. A way should be found to avoid this delay, which may mean the loss of many lives, untold suffering, and financial loss.

This initial delay could be avoided if the Federal Government would assume all expenses for a few days, say for the first seven days, after an officer of the Service has declared the existence of yellow fever in any locality. The proper measures could be then taken without a moment's delay, and it would give the local authorities a short respite to get together and make arrangements for the

continuance of the work. If there be a legal objection to this expenditure it might be so arranged that the city, county, or State would make itself responsible for this initial outlay and reimburse the Government therefor. The important point is to arrange it so that not a moment be lost in starting the required sanitary measures.

RELAY CAMPS.

During my service at various points I was brought in contact directly and indirectly with various relay camps established by the Service on railroad lines for the protection of noninfected districts. As far as known these relay camps were made necessary by the quarantine restrictions of local health authorities.

I consider relay camps unnecessary and a hardship on the railroads and the traveling public. They are a remnant of the old-time quarantine system, and in my opinion have no reason for existence.

Train crews can not carry infection unless one of the crew should develop yellow fever en route and his case be kept hidden or a mistake made in diagnosis. It is well known, however, that railroad employees are under an efficient discipline and that no one can leave his post without his superior officers having immediate knowledge of the fact. Furthermore, experience has shown that there is no one set of men more anxious to comply with quarantine restrictions or more amenable to quarantine regulations than the railroad people. It is therefore practicable to keep railroad employees under strict observation. With reference to a mistaken diagnosis none such could occur if all cases of fever among the train crews be considered and treated as yellow fever. A system of inspection and observation at convenient points along the line, with facilities for promptly screening any member of a train crew who may develop fever en route, would afford as much or more protection than the relay camp, and would at the same time do away with annoying delays in traffic and remove a serious item of expense to the railroads.

DETENTION CAMPS.

While the methods of combating the spread of yellow fever have undergone radical modifications since the mosquito theory of Doctor Finlay of the transmission of the disease was confirmed by Doctors Reid, Carroll, and Agramonte, but little improvement was noted in the recent epidemic with reference to detention camps.

This was due to public ignorance and prejudice. It would appear that with a more widespread knowledge of the methods of transmission of the disease simpler, more comfortable, and more effective measures might be adopted to keep under detention and observation those who desire to leave an infected focus. In other words, there seems no reason why we should have to resort to the wilderness to establish a detention camp. Such a camp could be established with comfort, safety, and less expense within the infected locality, in a building selected for the purpose and made absolutely mosquito proof, the "detains" being kept under medical observation for the required period and then sent in screened omnibuses to the railway cars. The transfer from the detention camp to the omnibus and from the omnibus to the cars could be made under a mosquito bar, hung over an umbrella, for instance, so that there would be no danger of the "detains" being bitten by a mosquito while the transfer is being made.

The railway car, of course, must also be mosquito proof. This plan is considered feasible and less expensive than the old detention camps hastily constructed in isolated spots, to say nothing of the discomforts experienced by all concerned.

It is well to observe that in carrying out the plan above outlined, the mosquito-proof railroad coach is absolutely essential. It must be said that during the past epidemic many coaches came under observation, but not one was seen that was mosquito proof. In many the wire screening was too coarse or the frames ill-fitting, but even where this was not the case, the door was at fault. The door presents the greatest difficulty, but that may be easily obviated by putting in double doors, the inner one about 4 feet from the outer, the intervening space being covered in with wire cloth attached to a wooden or iron frame.

GENERAL FUMIGATIONS.

General fumigations were common and popular in infected towns during the past summer. They served a good purpose, perhaps, from an educational standpoint, but practically were of little value, much time and energy being wasted thereon. Furthermore, they interfered with the methodical and scientific disinfection of infected localities.

The first two days succeeding a general fumigation, the fumigating crews invariably had trouble with the people who had "fumigated themselves" a day or two before.

While it is well for the public at large to interest themselves in killing mosquitoes, the fact should never be lost sight of that when yellow fever appears in a locality every effort should be concentrated in killing the *infected* mosquitoes.

Fumigation for the purpose of killing mosquitoes requires experience, and particular attention to minute details. When it is performed by inexperienced persons, in the vast majority of cases, it is ineffective. It simply drives the mosquitoes out of the room or the house, but does not kill them.

In conclusion, it is a pleasure to state that the relations with the authorities of the State of Mississippi and the city of Vicksburg were most cordial.

YELLOW FEVER AT NATCHEZ, MISS.

Passed Asst. Surg. C. H. Lavinder reports in part, as follows:

In compliance with the telegraphic instructions of the Surgeon-General of August 31, as follows: "Relieved from duty under White. Proceed by first train to Natchez, relieving Goldberger, and act as Service representative there * * *." I proceeded the same afternoon to Natchez, arriving there on the morning of the 1st of September, 1905, and on this date received from the Surgeon-General a second telegram with instructions to report to Passed Assistant Surgeon Young, at Jackson, Miss., by wire. From this time I continued, under his direction, to make daily telegraphic reports to him.

Shortly after the announcement of yellow fever in New Orleans in July the Natchez authorities, with commendable zeal, put into effect measures for the protection of their city. Inspectors were placed on all railroads and on steamboats (and later guards were placed around the city), an excellent and well-conducted detention camp was established, a force of men was put to work to improve the general sanitary condition of the city, and an oiling brigade was organized and began the work of treating the breeding places of mosquitoes. Mails and freight (with some exceptions) were freely admitted. From all that could be learned, however, their measures by reason of a want of harmonious effort and of improper execution in many instances did not prove of great value.

APPEARANCE OF YELLOW FEVER.

In the midst of this work Dr. J. W. D. Dicks, a local practitioner, on August 24, in the northern part of the city, a district largely inhabited by negroes, discovered in the person of a negro, Henderson White, what he regarded as a case of suspicious illness. While he and certain colleagues were holding this man under observation, there developed on the 25th, in the same neighborhood, in the person of a white woman, what soon proved to be a marked case of yellow fever. This discovery resulted in a general inspection of this area of the city, and the local profession found five positive cases of yellow fever and six suspects.

This inspection and a definite diagnosis was not completed until the 27th instant, on which date the local profession reported the presence of yellow fever in the city, and communicated with the State board of health.

On the morning of the 29th Surg. Eugene Wasdin arrived at Natchez and promptly diagnosed nine positive cases, confirming the five positive ones, and adding four more from the suspects. On the same date there was a mass meeting of the citizens, which was addressed by Surgeon Wasdin, with the result that a resolution was passed asking help of the Service through the governor of the State.

On this date the local profession took action by sending several persons to the hospital, fumigating the infected area, and establishing a cordon around the same. It may be noted in passing that the establishment of this cordon,

while eminently proper, by reason of some delay resulted in scattering many of the people whom it was intended to confine. The cordon, however, was conducted on a very reasonable basis, the guards allowing all well persons to pass out (temperatures and names being taken) on a promise to return to their homes for the night. Such treatment induced most of those who had escaped to return, and this cordon was maintained with a fair degree of success for some time.

On the night of the 29th Passed Assistant Surgeon Goldberger arrived under official orders. He likewise confirmed a diagnosis in nine cases, and, having been empowered by the city board of health to assume charge, he outlined a general plan of campaign against the disease, selected some assistants, and, with the aid of the city attorney, drew up a city ordinance under which the campaign was to be made. Before his work was well begun, however, he was detached, and, on September 1, I replaced him.

His general plan of campaign, with some changes, was adopted and a provisional advisory control was assumed pending more definite arrangements with the city authorities.

On the 3d instant, at the relay station near the city, I met Passed Asst. Surg. G. B. Young for consultation. By his advice and under his direction I met the next day the board of health and board of aldermen and stated to them that it was desired to know definitely my status in the community, whether I was to assume advisory or actual control, and, in the latter event, how funds were to be supplied and the amount of the same.

This conference resulted in my being placed in actual control of the situation with full authority to incur, on the part of the city, such expenditures as were deemed necessary. Accordingly, I assumed actual and full control of the situation on September 5.

GENERAL CONDITIONS.

Natchez is a thriving city situated on a bluff overlooking the Mississippi River. The population in the census of 1900 is given as a little over 12,000, but from the best information obtainable the present population is probably 17,000 or 18,000. A small part of the city (including wharves and railroads) lies below the bluff on the banks of the river and is called "Natchez under the hill." Several bayous cut through the city and surrounding country in various directions. The city is on a spur of the Yazoo and Mississippi Valley Railroad and is the terminus of a system of roads which run through Louisiana territory to the west and have here a ferry over the river.

There is much traffic by means of steamboats, and four or five large steamers make regular and frequent trips to various points up and down the river and indeed form the only source of supply for rather a large section of territory. The city is well situated for drainage, and the general sanitary condition of the place seemed good. There is a good city water supply, but underground cisterns were still found in abundance, and in the poorer quarters rain barrels were in general use. The cisterns and rain barrels, as well as the bayous, formed, of course, excellent breeding places for mosquitoes, which were ordinarily abundant.

Yellow fever had been discovered and announced but three or four days previous to my arrival. The city was promptly quarantined against by the county and nearly all southern territory, and indeed the city itself, in the absence of definite knowledge of the extent of its own infection, quarantined against many other places which were deemed worse infected. Business was greatly restricted, many persons had refugeed, the river steamers lay tied up to the wharves, and practically all railway freight traffic (and indeed passenger traffic) with southern territory was suspended.

The disease had been discovered in one rather limited area of the city, but the number of cases and attendant circumstances warranted the deduction that they must be at least secondary cases, and this meant that the disease had been in the city perhaps three weeks or longer. How many more cases would be discovered and what other areas of the city were now infected were doubtful and burning questions.

Pending definite arrangements as to my status, as already described, I devoted a large part of my energies for the first two days to railway and steamer freight traffic. After numerous consultations and discussions the fumigation of freight cars and steamers was arranged for and a limited quantity of freight shipped both by rail and by steamer. As surrounding communities gained confidence, this quantity was steadily increased.

In the meantime organization for a campaign against the disease was begun, and a determined effort was made by house-to-house inspection to learn the extent of infection.

ORGANIZATION, METHODS, WORK, AND COST.

Having assumed actual control under proper legal authority, as stated above, earnest attention was now given to extending and perfecting the more or less limited organization under which fumigation and other work was being temporarily done.

The organization as it finally developed and the method of doing the work perhaps merits a brief description.

The organization was composed partly of volunteers and partly of paid assistants, and the work throughout was conducted with the utmost harmony with the county and city health officers.

The county and State health officer, Dr. W. H. Aikman, in addition to his own onerous duties, acted as assistant director, and the city health officer, Dr. W. F. Fitchette, acted as executive officer, devoting practically his entire time to the work.

The work was conducted from one central office, with an office force of one stenographer, one general clerk, one property clerk, and one office boy, and was assigned to the following departments: (1) Inspection, (2) fumigation, (3) oiling and screening, (4) labratory, (5) educational, (6) sanitary nuisances, (7) freight and passengers (railway and steamer). Fortunately the establishment of an emergency hospital was not necessary. The large city and county hospital, under the direction of Dr. E. F. Brown, opened for use comfortable and well-conducted yellow fever wards, in addition to which, for those who desired more luxurious accommodations, the Chamberlain Sanitarium was open at the usual sanitarium rates. There were treated in the hospital a total of 80 cases of yellow fever with 2 deaths, in the sanitarium 14 cases with 1 death. The city and county conjointly had constructed near the city an admirable detention camp, but this was not much used.

For a brief time toward the end of the campaign five suboffices were opened in the various wards of the city, and were taken charge of by volunteer workers. Considerable work, principally in the way of mosquito destruction, was directed from these offices. They were also used as supply depots for fumigating and other material.

The composition and methods of these various departments with the work accomplished by them, together with some idea of the cost of the campaign, may be of interest.

1. Inspection department.—Dr. R. D. Sessions in charge, assisted by a board of diagnosticians composed of Drs. A. J. Hall, L. H. Lamkin, P. Beekman, W. H. Aikman, J. I. Grady, W. F. Fitchette, J. W. D. Dicks, Charles Chamberlain, and W. T. Jones, all of the medical profession of Natchez, with Acting Asst. Surgs. McDonald Watkins and B. G. Adamson; also by a corps of some 65 to 70 volunteer lay inspectors.

The scope of the board of diagnosticians was much broader than diagnostic work. These gentlemen acted really as medical inspectors, investigating all reported cases of sickness as well as treating most of the sick. A great part of this onerous duty was done gratuitously.

The corps of inspectors, composed of citizens of Natchez, was organized and directed by Mr. A. B. Learned. During Mr. Learned's absence for a time his place was filled first by Mr. T. C. West and later by Mr. R. F. Read. This very capable force, well organized and directed, rendered voluntarily a service that perhaps money could not have procured. A practical house-to-house inspection was made daily by this force. As the campaign progressed these inspectors were supplied with thermometers, and the value of their work in discovering sickness as well as educating people promptly to screen and report sickness can not be overestimated.

The reports made by these inspectors to their chief were in turn delivered to the chief of the department at the central office, who assigned them to the various physicians of the board of diagnosticians for investigation and report. There were discovered and reported by the inspectors of this department 153 cases of yellow fever. They reported 93 cases of illness in one day, and during their entire service turned in reports on 1,192 cases of sickness. All of this sickness was investigated by the board of diagnosticians, many cases requiring but one visit, while others demanded a great deal of attention. It has been

stated as a moderate estimate that in the performance of this duty the physicians who composed this board paid more than 1,500 visits.

2. Fumigation department.—Dr. John I. Grady in charge, assisted for a time by Mr. Sol. W. Lamb.

The unit of the force under Doctor Grady was the gang or squad, each formed of 1 foreman and 5 men (larger squads were found impracticable), in addition to which, of course, there were sufficient wagons to keep the various squads supplied with materials and to transport their material and apparatus when needed.

This entire force was increased or diminished for economical reasons, to meet the demands made upon it. The largest force at work at one time was some seventy-five foremen and men.

The work of this department was based on reports received from the inspection department and was conducted from the central office. Supplies also were issued largely from the central-office storehouse. The various squads, however, were under the more or less immediate supervision of the chief of the department and his assistant, both of whom personally and constantly visited all houses and areas where fumigation was being done.

The methods of fumigating were those in ordinary use; by sulphur and pyrethrum. Both of these agents were used in pots, 2 pounds of sulphur to 1,000 cubic feet of space, and 1 to 2 pounds of pyrethrum, with a time exposure in both cases of two to three hours.

One or two things are worthy of note. As the campaign progressed, experience taught that with a little care sulphur, as used, could be applied very generally with but little damage, and the use of pyrethrum, which was not deemed so satisfactory, was largely eliminated. Many houses were, of course, met with whose poor construction demanded much labor and ingenuity in pasting up holes and crevices. Under such circumstances, when large openings, like doors or windows, had to be closed, a piece of cheese cloth was tacked over the opening and on this was pasted large sheets of heavy paper. This novel method of closing such openings, originated by the fumigating department, is mentioned as easy and, in experience, effective.

The onerous and not always agreeable duty of supervising this department was ably and faithfully discharged throughout the campaign by Doctor Grady, who gratuitously devoted to it his entire time and attention.

Records of work done by this department are lacking during a few early days of the campaign. The records kept, however, show a total of 1,388 houses fumigated, containing approximately 6,000 rooms. Material used in this work approximates 19,000 pounds of sulphur and 1,000 pounds of pyrethrum.

3. Oiling and screening department.—Dr. J. W. D. Dicks in charge; Mr. James A. Farrell, superintendent of screening, and Mr. Andrew A. Fleming, superintendent of oiling.

This was divided into two subdepartments, both under the very able supervision of Doctor Dicks, who devoted much time and attention to this duty and gratuitously rendered very efficient service. To his lieutenants, both volunteers, Mr. Farrell and Mr. Fleming, thanks are likewise due for their good work.

(*a*) *Screening.*—Besides the superintendent, this department employed a foreman and five carpenters, but under a very economical arrangement, made by Mr. Farrell, he was enabled to pay for the services of these men only as needed.

In screening, cheese cloth, wire mesh, and screen doors were used. Ordinarily only one room in a house was screened, but in many cases several rooms or the entire house. Sometimes it was necessary to cover the walls of the room with cheese cloth by reason of poor construction of the house. The work was based on reports from the inspection department and conducted largely from the central office, but inspected by Doctor Dicks or one of his assistants.

During the campaign there were screened 272 rooms containing 570 windows and 400 doors. It may be noted that in most cases screening material was wisely left in place, even after fumigation, with the result that as many cases of febrile illness occurred in screened houses the same screening was efficient for two or more cases. This reduced expense and gave more efficient service, as many patients were thus taken sick in a well-screened room.

(*b*) *Oiling.*—This subdepartment employed a large force and was most ably organized and conducted by Mr. Fleming, whose services were fortunately secured. He was well fitted for the work, both from his knowledge of mosquitoes, as well as his executive ability. His force consisted of 7 volunteer

inspectors, assisted by a large corps of assistant volunteer inspectors, with a paid force of 1 foreman, 7 subinspectors, 14 laborers, and 7 mule carts.

The city was divided into seven districts, each of which was gone over thoroughly once every two weeks, including bayous, ponds, ditches, etc. It took the force five days thus to cover the city and suburbs. Their work consisted of inspection and investigation, as well as oiling. The complete force was at work only at intervals. In the meantime a small force, in the nature of flying squads, was maintained for special parts of the city.

During the campaign this force covered the entire city and suburbs thoroughly four times and many portions of the city several times. About 5 miles of bayous, ponds, and ditches were oiled, and 3,000 cisterns and 200 water barrels were screened and faucets placed therein. In addition to this, under their supervision about 200 pumps were installed in cisterns, and a great deal of special work, in the nature of investigation and inspection, with necessary treatment, was performed in every part of the city. This subdepartment used approximately 8,000 gallons of oil in this work. It may be noted here that the superintendent of this subdepartment was economical in the use of oil, having demonstrated practically and experimentally that in work of this character oil is often wasted by oiling too frequently and too freely.

The results obtained were excellent, and before the campaign closed the enormous reduction in the number of mosquitoes in all parts of the city was a subject of general comment. Persons, for example, whose houses and porches had harbored numbers of mosquitoes now for the first time enjoyed immunity from them, and they were in many places so reduced in numbers that the advent of even three or four was noticeable. Doctor Dicks in his final report expressed himself as follows: "The result achieved by this subdepartment * * * should prove conclusively that thorough systematic work done every year during the spring and summer months would reduce the number of mosquitoes in the city almost to zero."

4. Laboratory.—Dr. J. S. Ullman in charge. The laboratory, which was in fact Doctor Ullman's personal laboratory, was equipped for ordinary clinical work. Urinary and blood specimens turned in by the diagnosticians were examined largely by Doctor Ullman himself, whose services were entirely gratuitous.

The records of this department show 87 blood examinations, smears stained with Wright's stain, two or more examined for each case, and 76 urinalyses (many physicians made their own urinalyses). A limited search was made for the bodies described in blood smears by Porthier and other New Orleans workers, but none were found.

It is worthy of note that of the 87 blood examinations 25 were subsequently clinically diagnosed yellow fever, and of these 25 cases the blood of 14 showed malarial parasites, both æstivo-autumnal and tertian. This, with other observations, led to the belief that malarial parasites may be frequent in the blood of yellow-fever patients, thus rendering a blood smear of less aid in arriving at a diagnosis.

The urinalyses showed the usual early appearance of albumen, but in many cases albuminuria was very transient, and in others absent altogether.

5. Educational.—Dr. E. M. Rauch. The work of this department was devoted to a dissemination of knowledge among the people, with the purpose of gaining their intelligent cooperation.

Under the capable leadership of Doctor Rauch, who by reason of valuable laboratory and other experience, was well fitted for the duty, public meetings were held where addresses were delivered by the clergy and others. The ladies of the city were organized into a health club. The colored people were likewise interested in the work and organized a similar club. Literature was distributed and talks made in various places on the subject of sanitation and the mosquito question.

It is thought that the work done by this department will prove of permanent value, and great thanks are due Doctor Rauch for the time and energy he devoted to this important part of the campaign.

6. Sanitary nuisances.—Dr. Sprague Winchester, in charge. In the progress of the campaign general sanitary nuisances were found frequently which demanded attention, and the formation of a separate department to which all such matters could be referred proved justifiable. This was placed under Doctor Winchester's charge, and the time and energy he gratuitously gave to this work resulted in undoubted improvement in the general sanitary condition of the city.

7. *Freight and passenger railway and steamer.*—Acting Asst. Surg. B. G. Adamson in general charge, assisted by Acting Asst. Surg. McDonald Watkins and Sanitary Guard R. B. Forman.

This was strictly Service work and consisted of fumigation of steamers and empty freight cars before loading with inspection, and where necessary, fumigation of inbound freight cars; also supervision of the relay established on the Yazoo and Mississippi Valley Railroad by Passed Assistant Surgeon Young and of all passenger traffic.

There was nothing especially noteworthy in the performance of the work, and the methods used merit but little comment. The work done, however, was of great importance to business interests, and by means of this department Natchez was enabled to handle a great deal of freight to southern territory.

The work done by this department was as follows:

Outbound cars fumigated	784
Inbound cars fumigated	71
Inbound cars inspected and released	823
Number of times steamers fumigated	19
Number of times steamers inspected on return trip	19

The cost of the campaign was borne by the city (with the exception of aid by the State to the extent of a small sum, perhaps $400 or $500). The entire cost of the campaign during the time I was in charge (about two months), as given by the city clerk, was $12,941.33. This sum, however, includes some items not properly chargeable to the work, and the total cost will probably fall below $12,000. Of this sum the greatest expenditures were made by the fumigation department, next by the oiling and screening department. The expenditures of these departments closely approximate 65 per cent of the whole.

For the work done and results achieved this is not thought excessive, but it must be added that, by reason of many circumstances not necessary to explain, the figures are only approximate. For example, no hospital charges are included, because it was possible without extra expenditure to use wards in the city and county hospital, nor does it include strictly Service expenses of course, such as the pay of officers and Service assistants, nevertheless when all things are considered, the campaign may be regarded as economical.

YELLOW-FEVER STATISTICS AND DATA—NATCHEZ.

The total number of cases, and statistics pertaining thereto, up to October 28, when the work was officially closed, are given below. After this date a few sporadic cases occurred, the details of which are given in an appendix.

Total number of cases, city	192
Total number of cases, county	12
Total cases treated by Natchez physicians	204
Deaths	9
Mortality, per cent	4.41
City foci	76
County foci	8
Foci remaining free of cases for period of 25 days:	
City	25
County	1
(These foci were spoken of as "cleared foci.")	
White cases	97
Negro cases	107
Deaths:	
White	6
Negro	3
Mortality per cent, white	6.18
Mortality per cent, negro	2.80

For practical reasons a focus was defined as a city block in which occurred one or more cases of yellow fever. The county cases do not properly belong among the statistics, but their small number and proximity to the city rendered this arrangement convenient.

The first appearance of the disease in the northern part of the city and attendant circumstances have been described above. The disease originated and re-

mained among the negroes almost exclusively for a time. From investigations made later it seems more than probable that it was introduced into the city by a negro woman, who came from New Orleans about July 20 and took sick the following day. She was never very sick and was not seen by any physician during her illness. The first cases seen by the profession (about August 25) were then undoubtedly secondary cases. At the time of my arrival this part of the city was the only known infected area (except focus 6, where two cases had developed from original area and focus rendered inactive by prompt removal of sick and fumigation).

The second infected area developed secondary cases on or about September 10, and from the attendant circumstances and later investigation it seemed very probable that the disease was introduced here by a negro family which, evading the cordon, had come from the original area. This area was largely inhabited by people of the better classes.

Using the word "area" in the sense in which it is to be here understood—that is, to mean a section of the city comprising two, three, or more blocks in which the disease was not discovered until several secondary cases had developed, and infected mosquitoes were probably more or less widely disseminated, the two areas described above were practically the only such areas, at least to any extent, with which it was necessary to deal.

Continuing to trace the progress of the disease only in a very general way and excluding any explanation of small groups of foci it may be said that with the exception of these two first infected areas the disease spread in a rather remarkable way, and in a way somewhat difficult of explanation. The infection no longer appeared in areas, which was of course to be expected, as the organization was then fairly well perfected, the city was daily inspected, and screening and fumigation were being generally done. The disease, however (somewhat diminished in the number of cases, perhaps), continued to appear quite frequently, and now instead of areas of infection it was found that each new case (or by far the greater number of them) appeared in a new focus, and these foci often widely separated. Seventeen foci will account for 102 of the total 192 cases, and of the entire 76 foci 35 show only one case each, while 17 show but two cases each.

When the infection began to appear, each case almost in a new focus, it was natural to look for some public place which might contain infected mosquitoes, but although the post-office (which was twice fumigated, as well as once the entire block in which it stood) was for a time under suspicion, it was never felt to be justifiable to consider any such place the source of these cases. The only explanation which seems probable is that the public, educated to a thorough disbelief in transmission of the disease by personal contact, freely visited their friends in infected neighborhoods, against repeatedly published advice and warning, and were then bitten by infected mosquitoes, returning home to develop the disease and establish a new focus. This was the natural result of partial education, and adds, perhaps, another example of the danger of a little knowledge.

The original area was under cordon for a time, the second area for only one day. All guards in the city were then removed and none used thereafter (except in one or two special cases for a very brief while). This action was the subject of some critical comment by the reactionary element of the city. It was done advisedly, however, and seemed justifiable. Space forbids any full discussion of reasons, and such discussion would probably be profitless in any event. Briefly it may be said that the presence of two widely separated areas of infection, indicating fairly wide infection of the city, with indefinite knowledge as to the extent of infection in the city, the unsatisfactory results from the cordon already tried and the evident need of a far larger number of guards than that hitherto employed, with an enormous consequent increase in the expenditures, to say nothing of the tremendous annoyance to business and the ordinary affairs of life—these and other minor considerations led to the conclusion that at that stage of the threatened epidemic we were not justified in further using guards and cordons. As to what might have happened had guards been further made use of is now, of course, purely a matter of speculation.

The treatment of these two areas, which gave an immense amount of trouble and worry, consisted in thorough, systematic, and general fumigation, with screening of cases. The original area was fumigated, generally, block by block some four or five times, besides the numerous fumigations of special houses. The second was fumigated nearly as often. In spite of all this the disease would

reappear, and it was a matter of three weeks or more before these places were under control, the first area spreading widely in the meantime. Nevertheless persistent work gave results, and before the end of the campaign those two areas were almost entirely inactive despite the fact that both contained still a large number of nonimmunes.

In this work was met one of the greatest difficulties, which was the inability to fumigate thoroughly by reason of the presence of many sick in the houses needing fumigation. It was found not only difficult, but very unsatisfactory to attempt to fumigate a house containing a patient. There were objections and often reasonable ones, from both the people and the doctor. It was certainly a great annoyance to the patient, and in many cases not without an element of danger. In a poorly constructed house it was practically impossible. In a well constructed one, even with great care, sulphur fumes would often penetrate the sick room, to say nothing of the effect of the noise and confusion upon a nervous individual ill with an acute disease. Removal of the patient from one room to another was often feasible, but met with great opposition, so that if fumigation was done, the house was only partially treated after all. Removal to hospital, the only satisfactory solution, is obviously not generally possible.

The treatment of these two areas likewise taught that when a large area is well infected it requires persistent, systematic, and thorough effort to eradicate mosquitoes. Almost without exception it was easy to succeed in preventing secondary cases where there were only one or two original infecting cases to deal with, although many times the disease was not promptly discovered and screened. Thorough and wide fumigation, repeated in about ten days, in almost every instance resulted in rendering the focus inactive. The statistics, too, show that 25 foci were "cleared" (one-third of the total). Had the campaign been closed one day later than was the case there could have been shown 40 foci "cleared"—i. e. inactive for twenty-five or more days—which is 62½ per cent of the total number.

RESULTS.

In summing up the results achieved by the campaign, when all of the circumstances and conditions are taken into consideration, it may with justice be felt that in all likelihood the city was saved from an epidemic of large proportions.

Making due allowance for refugees, the city contained perhaps 15,000 people, a population very largely nonimmune. The extent of the infection, as shown, was, to say the least of it, certainly not restricted—indeed it was rather widely spread. The disease appeared early in the season. The time for the perfection of so large an organization as was required for the campaign was brief and the work at first was in consequence not so well done. The ignorance among a large mass of the people, whose cooperation was necessary to success, and the time required for educational work among them were elements of immense importance; also the energetic and pernicious opposition of a reactionary element, which, though decidedly in the minority, was nevertheless a factor of much gravity and consequence. This activity stood in marked contrast with the almost equally marked passivity of a great number of those whose support was obtained. To all of this may be added many delays, vexations, and difficulties, and some idea is gained of the trials of undertaking such a campaign as it was necessary to conduct.

There has been given above a tabulated statement of the results, which shows a total of 192 cases in the city with 9 deaths. Allowing a population of 15,000, this gives only 1.28 per cent of the population stricken with the disease and a mortality rate of 4.41 per cent. The last epidemic of yellow fever which occurred in Natchez, according to credible statistics, developed on September 1 and lasted till November 24, 1871. There occurred about 1,200 cases of the disease with 99 deaths in a population of 9,000. This shows 13.33 per cent of the population stricken with a mortality rate of 8.25 per cent. The disease also appeared that year later than it did this year.

This analogy, which is the only practical means of estimating results achieved, is certainly vastly in favor of the methods of this year. An examination of statistics for other years, if available, when the disease appeared very late and never assumed epidemic proportions, would, I feel sure, from what was learned in Natchez in a general way, be likewise in favor of the recent methods.

COMMENTS AND CONCLUSION.

Comment has already been rather freely made on parts of the work, but before concluding a few additional comments are offered on some matters of interest, and, without any attempts at an exhaustive statement, to draw one or two conclusions which are deemed of importance.

Among the very large number of difficulties met in a campaign of this character, reference to many of which has already been made, perhaps not one contributes more to failure than opposition (or nonsupport) from the people among whom the work is done. Indeed, more or less general cooperation by the inhabitants is an essential to success. A great deal of authority, properly supported, and much money readily available, are likewise, it is almost needless to add, essentials to success. The latter two, important as they are, will not, I believe, prove sufficient without the former. Indeed, nothing is known of more import in this work than the urgent need of general popular support. In the work at Natchez it has already been shown how freely the support of the public was given, but little has been said of the opposition, or, if it may so be called, the reactionary element. This element, small in numbers when compared with those supporting, nevertheless numbered many persons and more than once proved a stumbling block in the path. It is not thought unjust to say that they are in great measure responsible for not bringing the campaign to an earlier successful conclusion.

The opposition met with consisted not alone in obstruction of work, but in questionable comments on motives, with constant unjust criticism of all that was done. It was, in brief, an actively waged anticampaign. This opposition was even met in one of the courts, where seeking to punish legally an obstructionist under the city's ordinances, not only was there failure to secure punishment, but the cause and some of the assistants received from the defendant, as a witness, unrebuked, harsh criticism and abuse. This particular instance resulted in a threat to resign on the part of some of the assistants whose services could illy be spared, and seemed in every way a matter of so great importance that it was felt justifiable to threaten withdrawal of Service aid if better support were not given, whereupon unmistakable evidence was given by the citizens of Natchez that they desired a continuance of services and would give in return fuller support. The experience, however, was too severe a blow at prestige easily to be recovered from, and in other ways it jeopardized success.

As for authority, the mayor and board of aldermen showed themselves willing at all times to pass any ordinances in reason to aid in the work. The powers conferred by the ordinances passed were ample, if supported in the courts.

There has already been explained the source of the funds, which were not restricted, and were freely disbursed upon request. Bills and pay rolls, approved by me, after proper legal approval by the necessary member of the board of aldermen, were always promptly paid from the city's funds.

Among matters of less importance it seems worthy of note that in so much fumigation with sulphur very little damage was done. Almost all complaints of this character, upon investigation, proved ill founded. Considering the circumstances under which they were used, sulphur was found as a mosquito destroyer far more effective than pyrethrum. Indeed, there was much distrust of the latter, and as the campaign advanced it was made evident that sulphur could be quite generally used with a few precautions and little damage done. The urgent need of some efficient mosquito destroyer, without the disadvantages possessed by those now used, is too evident to need comment. Such a discovery would be of untold aid in a campaign of this kind.

In this connection it may be mentioned that several "general fumigation days," on which the public generally was asked simultaneously to fumigate their houses, were appointed and widely advertised. These requests were at times more or less generally complied with. It is felt, however, that the "general fumigation day" is of little value and may even be harmful.

The difficulty of properly fumigating houses containing sick has been already commented on. Prompt removal of all sick to the hospital, except in the very beginning of an epidemic, is an ideal not likely to be reached, but it would certainly vastly increase the chances of successfully combating the disease. Removal to hospital by force was a power granted under the city ordinance, but circumstances seldom justified using it. However, under certain circumstances several sick were forcibly removed and there was no cause to regret it. Fumigation of houses containing sick was not generally done until the sick

person was well enough to be removed—ordinarily a very brief time. Dependence had to be placed on screening and on various attempts at destruction of mosquitoes in the sick room and adjoining rooms by other means than fumigation. For this purpose there were used with some success, at one time, piston hand pumps and one of the numerous mosquito-destroying solutions found on the market. The screening squad was supplied with these.

Of course concealment of cases had to be contended with. It is a pleasure to state, however, that this was not done to any great extent. The only remedy for this is of course a good inspection force and prompt punishment of offenders when possible. Proper evidence is, however, difficult to secure. The clinical character of many of the cases made concealment easily possible and at times innocently so. The disease was for a time largely among the negroes and was generally of a very mild type among them. This, in conjunction with the general prevalence of malaria, often made diagnosis exceedingly difficult. It was the policy of course to treat all acute febrile illness of a doubtful nature by screening and fumigating regardless of the diagnosis. In some instances, however, when previously uninfected portions of the city were involved early diagnosis was nevertheless a matter of much importance.

The necessity of a hospital is too evident to need comment. The necessity of trained assistants, preferably those whose capabilities are well known to the officer in charge, is almost equally evident A campaign of this character is too brief to permit of successfully perfecting the organization necessary with new and untried assistants.

It is almost needless now to add, in the light of recent general experience in the South, that one can not go through a campaign of this character without being more firmly convinced that the mosquito is the only means of conveying the disease.

Before concluding it is desired to express appreciation of the harmonious cooperation of the health officers, medical profession, clergy, and the other volunteer workers who assisted in the campaign. A debt is due to the press of Natchez for much aid also.

Finally it is desired to express admiration for the civic pride and patriotism displayed by the citizens of Natchez in authorizing unaided such a campaign. This is well worthy of comment, and the example set by this city it seems might be followed by other places with profit to themselves and to the South.

The State board of health, after two light frosts, having raised all quarantines, I discontinued my organization and closed my work on October 28, recommending to the mayor and board of aldermen that the city health officer (assisted by the county health officer, who had kindly volunteered his services) be empowered and authorized to continue such fumigating and screening work as might be necessary for the few cases of the disease which might further develop.

The appearance of new cases at this time was so greatly reduced and the season so late that further spread was not deemed possible, though some further cases for a few days might be expected.

My recommendation to the mayor and board of aldermen was approved and the health officer placed in charge of the work.

I regret that I am unable at this time to give definite figures as to cases, etc., after the close of my campaign. I am in the possession, however, of certain information which, I think, authorizes me to say that there were but three or four more cases reported in the city, all recoveries, with one fatal case in the county.

I give below the ordinance passed by the mayor and board of aldermen for the purpose of conducting the campaign. This ordinance was drawn by Passed Assistant Surgeon Goldberber and the city attorney.

This, together with other city ordinances in force, was found sufficient with one exception, which was later remedied by an amendment.

The ordinance, as drawn, gave us power to fumigate houses containing sick, but did not definitely give authority to fumigate houses deemed by us infected regardless of occurrence of yellow fever therein. There were many houses in which no yellow fever had developed, although they probably contained infected mosquitoes. Their fumigation was, of course, a matter of great importance.

The amendment passed to remedy this defect gave us full power to fumigate any house deemed infected, and in case of objection and obstruction authorized us to place the house under rigid quarantine till fumigated. It also provided a suitable penalty.

"AN ORDINANCE.

"An ordinance for the prevention and suppression of yellow fever and other communicable diseases having the mosquito as one, if not the only means of transmitting such diseases from person to person:

"SEC. 1. Be it ordained by the mayor and board of aldermen of the city of Natchez, in council convened, that all wells, cisterns, tanks, reservoirs, barrels, tubs, buckets, vats, pools, ponds, ditches, and other articles capable of holding water therein, within the incorporated limits of the city of Natchez, other than those which are screened in such a manner as to prevent mosquitoes from getting therein or escaping therefrom, is hereby declared a public nuisance, provided that where such screening is impossible, coating and keeping the surface of such water coated with oil shall be considered an equivalent.

"SEC. 2. Be it further ordained that any person, firm, company, or corporation having any of the water containers mentioned in section 1 of this ordinance on his, her, or its premises, or upon any lot, or block of land under his, her, or its control within the incorporated limits of said city, which contain water, who shall fail or refuse to keep such water container so screened as to prevent mosquitoes from getting therein or escaping therefrom, or in lieu thereof where screening is impossible, who shall fail or refuse to cover the surface of such water with oil and keep same so covered, shall be deemed guilty of a nuisance, and upon conviction shall be fined in any sum not less than $5 nor more than $50, and each day's refusal, neglect, or failure shall constitute a separate offense.

"SEC. 3. Be it further ordained that when the city health officer has reason to believe that a person is suffering from yellow fever, it shall be his duty, together with such assistant physician and health inspectors as he may appoint, to enter the houses or premises of any inhabitant of said city and inspect, fumigate, and disinfect the same, and to remove any sick person therefrom when in his judgment such case can not be efficiently treated at the patient's house.

"SEC. 4. Be it further ordained that the county and State health physicians and the several physicians of the Public Health and Marine-Hospital Service of the United States and their aids, assistants, inspectors, and employees, while engaged either in the treatment, suppression, or prevention of yellow fever or other contagious or infectious disease in said city, are hereby vested with the same powers and authority delegated to the city health physician and his assistant physicians and health inspector by the third section of this ordinance.

"SEC. 5. Be it further ordained that any person, firm, company, or corporation who shall refuse to permit any of the physicians, inspectors, and employees mentioned in the third and fourth sections of this ordinance to inspect his, her, or its premises, or who shall resist the removal of any sick person who has been pronounced by the city physician or his assistant physicians or by the county or State physicians or by a physician of the Public Health and Marine-Hospital Service of the United States to be affected with yellow fever or other infectious or contagious disease, shall be guilty of an offense, and upon conviction shall be fined in any sum not less than $5 nor more than $50.

"SEC. 6. Be it further ordained that any person, firm, or corporation who shall permit the larvæ of mosquitoes to exist on his, her, or its premises within the incorporated limits of said city shall be deemed guilty of an offense, and upon conviction shall be fined in any sum not exceeding $10.

"SEC. 7. Be it further ordained that whenever in the opinion of the mayor the said city is threatened with an epidemic of yellow fever, he is authorized to order by proclamation or otherwise that all persons, firms, companies, or corporations shall fumigate, in a manner and at the time to be prescribed by him, his, her, or its dwellings, residences, buildings, or outhouses, and any such person or persons, firms, companies, or corporations who shall fail to comply with such order shall be deemed guilty of an offense, and upon conviction shall be fined in any sum not less than $5 and not more than $50, and each day's refusal, neglect, or failure to comply shall constitute a separate offense.

"SEC. 8. Be it further ordained that all ordinances and parts of ordinances in conflict with the provisions of this ordinance be, and the same are hereby, repealed, and that this ordinance take effect and be in force from and after its passage, ordained this 1st day of September, 1905.

"W. G. BENBROOK, *Mayor.*

"[SEAL] GEO. T. EISELE, *City Clerk.*"

YELLOW FEVER IN PORT GIBSON, MISS.

In pursuance of telegraphic orders of September 28, 1905, as follows, "Proceed immediately to Port Gibson, Miss., where Guiteras states we should have an officer; report to Guiteras by wire," Passed Asst. Surg. J. B. Greene reached Port Gibson September 30. Following is his report of operations at that place:

Leaving New Orleans on the morning of September 29, my arrival at Port Gibson was delayed to the early morning of the 30th on account of a washout of railway track. On arriving at destination I immediately reported by wire to Surgeon Guiteras at Vicksburg, then proceeded to the office of Doctor Acker, health officer for the State of Mississippi, and conferred with him as to the campaign. Doctor Acker was at all times in complete harmony with Service methods and gave perfect cooperation. Mayor Smith of Port Gibson then called a meeting of the board of aldermen to furnish the necessary means for the proper management of the epidemic. Next, all the physicians of Port Gibson, to the number of six, conferred with me at the mayor's office.

At this time I received the hearty cooperation of the physicians, the health officer, the mayor, board of aldermen, and the citizens of the town of Port Gibson, and whatever measure of success followed Service efforts was largely due to this hearty cooperation. Authority was promptly granted to secure Foreman Remley from New Orleans, who rendered, while on duty there, most faithful and painstaking services both as a screener and fumigator. He arrived on the evening of the following day (Sunday). After conference with the physicians of the city it was learned that 5 cases of yellow fever had been discovered, though many more had existed for some time, largely among the negro population, and in such a mild form that it is not strange that the true nature of the disease was not determined. It was then apparent that it would be necessary to deal with widely scattered foci, situated in different parts of the town. On visiting infected points it was discovered that two sections of the town were thoroughly infected, so much so that hardly a house escaped the disease. One of these sections was in the eastern part of the town not far removed from the business quarter, and the other was in the western section known as the "Drake addition." Every energy at this time was devoted to fumigation. After organizing two fumigating squads, one under the direction of Foreman Remley and the other under the direction of Professor Hand, a house to house fumigation was at once begun in the infected area. On account of the open structure of the negro houses the work of fumigation was rendered especially difficult. It required the expenditure of great quantities of paper to properly seal the cracks in the houses. Experience in New Orleans had proved the absolute necessity of thoroughness in this work. If the houses were not properly sealed to prevent the exit of the stegomyia, the fumigation was worse than useless, for it only drove them out and this carried infection to the neighboring houses. At the beginning also the citizens volunteered to attend to the inspection and emptying of receptacles of mosquito larvæ; also to oil the stagnant pools and cisterns. However, the town was already so infested with stegomyia that the efficacy of this work was not encouraging. At this time there was also secured the cooperation of the leading colored citizens in the work of inspection so as to discover cases of concealed illness. The city was divided into four sections and each section was placed in charge of a responsible negro inspector. They were required to report promptly the discovery of all cases of illness, which Doctor Acker and myself immediately investigated. In case a physician had been called it was not deemed necessary to investigate further. In case they had not sent for a physician, and were not disposed to do so, Doctor Acker and myself took charge of the case. A small emergency hospital with a screened ambulance service was organized, but the cases began to diminish so rapidly, and the fact that there was considerable opposition among the people to being removed from their homes led to an early closing of the institution. If the epidemic had increased, as was at one time feared, the hospital would have been of great service not only to the sick, but also in stamping out the epidemic. On account of the houses being so open and the epidemic being so general very little screening of the houses was done. As a substitute for this, however, every patient was supplied with a new mosquito bar, and minute instructions given as to its use. Either Doctor Acker or myself gave these instructions. Inspections were occasionally made to see that the patients were properly kept under the bar.

During the epidemic there were reported, including the 5 cases discovered prior to my arrival, 62 cases of yellow fever. Of these, 13 were white and 49 were colored. As to sex, 33 were males and 29 were females. The number of deaths were 4, making a percentage of mortality 6.45. Three of these deaths were colored and one white. The white case was a patient discovered by Surgeon Guiteras and Doctor Harralson on their visit to Port Gibson, September 26, when the presence of yellow fever was discovered. One of the colored patients also, whose death occurred, was ill on my arrival at Port Gibson. It may also be added that the 4 deaths were among male adults above the age of 40. Neither woman nor child succumbed to the disease. The last case was taken ill on October 19, though the diagnosis was delayed until the 22d. A slight frost occurred on the night of October 14, but not heavy enough to affect seriously the stegomyia.

It may be of interest to relate the probable history of the epidemic at Port Gibson. It is currently believed by the physicians of that place that the yellow fever reached there from an excursion to New Orleans in July shortly before the presence of the disease had been announced in that city. Surgeon Guiteras expresses the opinion that other points along the Yazoo and Mississippi Valley Railroad secured their infection at the same time. It is also a fact that in the epidemic of 1878 at Port Gibson the first case discovered in Port Gibson was taken from a steamer from New Orleans. In the epidemic of 1878 at Port Gibson the first occurred in the person of a Swede employed on a river steamer from New Orleans. The first case discovered in 1905 was also in a Swede. This fact seems worthy of mention. The mortality as compared with the epidemic of 1878 is most striking. With a population perhaps slightly less in the earlier epidemic the deaths were 160 in the town alone, with a considerable number of deaths in the county. The first case in 1878 was discovered early in August and it is likely that the present epidemic was introduced about the same time, or a little earlier.

YELLOW FEVER IN HAMBURG AND ROXIE, MISS.

Passed Asst. Surg. John McMullen, reports, in part, as follows:

Arrived at Hamburg on the morning of October 9, 1905, and found it to be a small town of about 375 people normally, but somewhat less at the time of writing owing to the fact that many had hurriedly left town when yellow fever was announced several weeks previously. The infection at this point seemed to have been of a very virulent type as the death rate had been about 25 per cent among the white population, while at Roxie, 5 miles distant, the death rate was even larger, as one-third of the cases proved fatal. Many of the cases soon showed a marked hemorrhagic tendency and bleeding from the mucous membranes was a serious symptom. The situation at Hamburg at this time was distressing; all business houses were closed and several of the leading merchants and town officials had died of yellow fever. The town treasury being empty, the local health officer had requested assistance from the State, and nurses and doctors were sent, while the neighboring towns sent in supplies in abundance. The nonimmunes were now unable to get away as the town was in rigid quarantine, all roads were under guard, and no trains were allowed to stop in the town limits. The county health officer, Doctor Magee, was overtaxed, as the two other local physicians were ill with yellow fever, and had been kept too busy looking after the sick to institute any measures to prevent a further spread of the infection. Nothing had therefore been done to stay the spread of the disease. Several physicians had been sent there by the State to aid him but, for various reasons, soon left. Two of the men sent contracted the fever and one, Doctor Rausch, of Vicksburg, died several days after having been returned home. When this doctor contracted the disease the State requested the assistance of the Service, and I was put in charge of the situation as the Service representative and informed that it was the desire of the State board of health that I assume absolute charge of all sanitary measures.

Yellow fever was announced in Hamburg on or about September 10 and, previous to October 9, when I arrived, there had been 56 cases—52 whites and 4 negroes—with 12 deaths, all white. Several cases occurred within a few days of each other and in the same house, showing the infection to have been from the same source.

At the time of my arrival cases had occurred on both sides of the railroad and the infection was scattered throughout the town. A general fumigation, therefore, and moving new cases to an emergency hospital, or screening in their homes in case moving was impossible, was deemed to be the remedy to be applied immediately.

I strongly recommended that this be done at once, but since neither labor nor materials could be had in Hamburg it was requested that these be sent immediately. At the request of the secretary of the State board I wired him a list in detail of materials and the number of laborers required to do this, with the result that laborers were sent from New Orleans who were familiar with screening and fumigating and materials from Jackson and neighboring towns. The school building had been fumigated, screened, and prepared for an emergency hospital, but the people were strongly opposed to being moved from their homes, and it was decided to screen them there, do preliminary fumigating, and a final fumigation upon the death or convalescence of the case, or at the earliest possible moment not to do injury to the patient. There are about 75 houses in Hamburg, but some of these are negro huts, situated in the suburbs, and fumigation of some few of these was considered unnecessary, and besides the very open manner in which many of them were built rendered it practically impossible to do thorough fumigating. About 50 houses were fumigated with sulphur and the stores were treated with culicide. In commencing the fumigation I endeavored to first treat the infected houses where there yet remained non-immunes. The uninhabited houses were treated at night in order to gain time.

The post-office, railroad station, all churches, etc., were included in the fumigation. Oiling of all pools, etc., was done where necessary to prevent breeding of mosquitoes and to destroy existing wigglers. During my stay in Hamburg, from October 9 to 20, 7 cases of yellow fever developed and 3 cases died. Doctor Magee informed me that no cases had occurred since that time. There were, therefore, 63 cases all told and 15 deaths. The negro cases were almost invariably of a mild type and not one proved fatal, thus showing a rather high mortality among the white population.

ROXIE.

In accordance with instructions I left Hamburg October 20 carrying my materials and fumigators with me to Roxie, a town of about the same size as Hamburg and in the same county, 5 miles distant. The first cases, 2 in number, occurred here shortly after the Hamburg cases and were in the hotel, but the local doctors failed to diagnose them as yellow fever for some days afterwards. At the time of my arrival there had been 17 cases of yellow fever and 5 deaths, the 15 cases being secondary to the 2 hotel cases. I followed the same line of treatment in Roxie as in Hamburg, and 40 houses were fumigated. A few sporadic cases occurred after my departure, among the negro population.

I found the people in both of the above towns to be firm believers of the fact that yellow fever was transmitted only by the stegomyia fasciata; this belief was not universal at the beginning of the outbreak of fever in New Orleans, but was gained by a dearly bought experience with the disease in their own community. They were therefore very glad to have the screening and fumigating of their houses done as early as possible.

As to the mode of infection of these towns, there have been numerous theories advanced by the local doctors and the citizens. A large excursion from New Orleans in July is said to have infected many points along the Yazoo and Mississippi Valley Railroad, on which these towns are situated, and also the Illinois Central Railroad; but it has been impossible to trace the infection directly to this source.

The most plausible theory of the introduction of the infection would seem to be as follows:

About two weeks (or more) previous to the first cases in Hamburg, a squad of Italian laborers on the Yazoo and Mississippi Valley Railroad, south of Hamburg, became infected and were taken in charge and sent to New Orleans. The foreman of this squad also, moved his family, who had previously been with him, to Hamburg. In a few days one of his children was taken sick with a mild fever, but soon recovered and nothing was thought of it, and the family moved away shortly afterwards. The first cases of fever were recognized within two or three weeks, and these cases occurred in the house next the one vacated by the railroad man.

Doctor Magee, the county health officer, aided me in every way possible in handling the situation at both Hamburg and Roxie.

In accordance with telegraphic instructions, I returned to New Orleans on October 24, 1905.

INSPECTION OF THE GULF COAST BETWEEN MOBILE AND PASS CHRISTIAN—YELLOW FEVER IN MISSISSIPPI CITY, GULFPORT, AND HANDSBORO—GULF COAST MARITIME PATROL.

Surg. Eugene Wasdin reports, in part, as follows:

In obedience to telegraphic order of July 23, 1905, which read: "Nominate and place on duty temporary acting assistant. Take first train for Mobile. Make quiet investigation there, conferring with local health authorities. Then inspect points between Mobile and Pass Christian, not entering New Orleans. Wire arrival and departure at each place, using code when necessary in reporting conditions. Status special temporary duty. At Pass Christian await further orders." I proceeded to Mobile, reaching that city on the evening of the 24th; there made quiet inquiry as to the local health conditions, and on the morning of the 25th conferred with representatives of the city board of health and of the State board of health of Alabama. These gentlemen provided every convenience, and assured me that there was not then, nor had there been, a single case of suspicious disease, or one resembling yellow fever, in that city. This investigation being satisfactory, I left the city on the afternoon of the 25th, convinced that thus far no fever had been there propagated from New Orleans, and after careful consideration was convinced that Gulfport offered greater facilities for the proper inspection of the coast cities, as well as the inland towns along the Gulf and Ship Island Railway, so this point was reached on the afternoon of the 25th of July. I found the city in a most perturbed state. Of but recent commercial importance, there were not yet formed those civic arrangements for the care of the public health which lend courage to a community, and more or less confusion prevailed in their hurried establishment to which the Service was able to lend assistance. A careful survey of the conditions showed the gravity of the situation and the importance of Gulfport as a strategic point.

On the 27th the telegraphic order was received making headquarters at Gulfport, Miss. Upon approaching the mayor and aldermen of the city, and its prominent citizens, I met a most cordial reception, and an immediate response to the Service tender of help. I was assured of every assistance and a hearty cooperation in the work contemplated. At a public meeting in the court-house hall many addresses were made laudatory of the help given by the Public Health and Marine-Hospital Service on the coast in the past, and expressions of confidence in its helpfulness under existing conditions. At this meeting occasion was taken to lay before the populace the cardinal points of the new doctrine of the propagation of yellow fever, through the agency of the mosquito, stegomyia fasciata, and the important lessons in the application of the simple rules which had been formulated for their protection under this doctrine. The mass of the people accepted the facts. The medical profession was called together.

None of them had had a case of "undefined continued fever, with tendency to noncorrelation of pulse and temperature, albuminuria," etc. All were enthusiastic as to the mosquito doctrine.

My first duty was to inspect carefully the coast cities. To do this properly, the appointment of Drs. C. A. Sheely and Charles Le Baron was recommended to act as assistant surgeons, and Doctor Le Baron was sent to Biloxi on the 27th and Doctor Sheely to Ocean Springs, Scranton, and Moss Point. They were carefully instructed as to the importance of gaining the confidence of the profession and people in their explanation of the mosquito doctrine and its lessons, and of gaining accurate knowledge of prevailing health conditions. Doctor Le Baron reported Biloxi and vicinage clean. Doctor Sheely reported Ocean Springs, Scranton, and Moss Point clean. A thorough inspection of Gulfport and of its environing villages, Mississippi City, Handsboro, and Long Beach, after seeing all cases bearing the slightest suspicion, and careful questioning of the physicians resident in them, gave the conviction that no fever had thus far gotten into these municipalities.

Inspection of Pass Christian and of Bay St. Louis and their suburbs showed them clean. In each town visited the profession gave ready promise to keep on the qui vive and to report promptly to me at Gulfport any case of sickness of suspicious character.

On the night of July 26 I met in conference the governor of the State of Mississippi, the Hon. Jas. K. Vardaman, who after a long and interesting discussion, announced that he would accept the mosquito doctrine and place everything in Service hands, in conjunction with the State board.

Coincident with the duties of inspection of local premises, there arose those connected with the proper inspection of trains leaving New Orleans over the Louisville and Nashville Railroad, with termini at the west Mississippi border at Pearl River and the relay station established by Alabama at Grand Bay, just within her western boundary. All passenger trains between these termini were carefully inspected at first by a civil guard, but at the earnest wish of the governor of the State these were displaced by uniformed State militia as volunteers for special duty.

All freight trains stopping within the State were relayed at a camp at Dunbar, La., the train personnel being under the military guard. This was the only railway line coming under my jurisdiction.

On the 16th August I wired the Bureau that the conditions were such that a great outbreak was possible, and in view of this requested the detail of four assistant surgeons and at least one good pharmacist. The Bureau's suggestion on the 26th that a representative be appointed at each of the coast cities was timely, but the evident good faith of the local health authorities in these cities induced a delay of such appointments until the possible infection of such cities, and this met Bureau approval in a message of the 27th, containing instructions to await such infection before making appointments. This trust in the local health officials was justified, except in one instance, that of Scranton and Moss Point. At all other places there was encountered only an intelligent earnestness on the part of the health authorities to protect their communities from infection, and at the same time to discover such possible infection at the earliest moment and to treat it after the methods inculcated. At all points the endeavor was made to instill the essence of success, viz, an honest acknowledgement of suspicious disease, and under existing conditions the advice was given that all febrile attacks should be called suspicious.

Careful screening of the patients from the very beginning of these attacks was advised; and a life history of the infective insect was plainly given them, showing the time limits at which they may become infective, and the periods which must elapse between their contamination from feeding upon a yellow-fever patient and the development of their infectiveness for another person.

THE YELLOW FEVER IN MISSISSIPPI CITY.

The city of Mobile and the State of Alabama had placed a rigid nonintercourse quarantine upon the entire Gulf coast east of and including New Orleans soon after the exposure of the infection at that place. The Alabama health authorities were approached as to the advisability of lifting their quarantine against the coast cities of Mississippi. In reply, the State health officer, Doctor Sanders, and an inspector, Dr. Charles Mohr, visited these cities on the 13th of August in order to assure themselves of their freedom from the infection. In this inspection I joined, visiting with them Scranton, Ocean Springs, Biloxi, and Gulfport. On the 14th they inspected Pass Christian and Bay St. Louis. While inspecting the suburbs of Gulfport, on the morning of the 14th, these gentlemen became suspicious over a condition found in one household in Mississippi City, mainly, as Doctor Sanders explained, because in this household one sick person had refused to have him see her. Doctor Sanders gave assurance that he had seen nothing suspicious, and, save that refusal, he could not say that he had seen anything to call yellow fever. But he refused to promise to lift the quarantine, and returned to Mobile with his suspicions rather stiffened against the coast.

Credit must be given to this visit of the Alabama officials that although they *saw no cases of fever* (by their own acknowledgment) the presence of even suspicion at the suburb of Mississippi City had not been reported to me by Dr. Charles Galloway, in whose practice the case refusing to be seen had occurred, and their complaint to me of such refusal was the first notification of such case. A thorough investigation of Mississippi City was thereupon made

August 14, and just as it was begun Doctor Leger, a local practitioner, reported a case in his practice which had that morning caused him uneasiness.

The yellow fever in New Orleans was actually known to be existing, according to many hearsay authorities, in May or early in June, but just what time it was introduced into Mississippi City could not be accurately ascertained.

A most exhaustive reseach finally left uncertain the time and place of the first cases. That it came from New Orleans there can be no doubt, and it is more than probable that the origin was in a boarding house at which many New Orleans people were entertained in a family of which several children were sick in early June. The cases in Mississippi City numbered 107.

YELLOW FEVER AT GULFPORT.

Surgeon Wasdin, in his report, states that on the evening of the 24th of August he was informed by a practitioner of Gulfport of certain suspected cases, which on the following day he diagnosed as undoubted yellow fever, 4 cases in all. He then traces the infection to a grocery store in North Gulfport and shows that the latter was infected from the cases in Mississippi City.

The fever in Gulfport spread slowly, and at the close of the quarantine, October 23, had numbered 119 cases, with 4 deaths.

In preparation for an outbreak, and to more readily detect any latent cases, a house to house inspection had been instituted in Gulfport early after Surgeon Wasdin's arrival there. The city is divided into four unequal wards by the crossing of the two railroads, the Louisville and Nashville and the Gulf and Ship Island. To each of these wards physicians were appointed as inspectors by the mayor's board and reported to Surgeon Wasdin at stated intervals until the outbreak of the fever, August 24. Upon the outbreak of the disease every energy was turned toward its eradication from the Fourth Ward in which it arose. After careful diagnosis, and even before this determination, the suspected house was at once put in the hands of a screening corps, all cracks were securely pasted over with strips of paper, and the windows and doors screened with fine-mesh gauze or cheese cloth. Thereafter there were invariably two disinfections done with sulphur burned in open pans.

Surgeon Wasdin writes:

The energetic effort then put forward seemed at once to meet with success, and it was hoped about the 16th to 19th of September that the disease had been stamped out. On the 20th another outburst occurred, and in searching for its cause we found the greatest derelication of duty on the part of two officials, who were punished later by the loss of their position under the city government.

Special days were selected for general fumigations, and notice given by handbill proclamation from the mayor's office and in the press, but such fumigations were only partially successful, and many instances came to my attention of the most inefficient methods of using sulphur. Committees of the best citizens were formed at my suggestion, and personally called upon the people in their respective wards to urge a proper fumigation. Even this succeeded but indifferently well, and it was finally decided to place each ward under the direction of one of my acting assistants, who would personally supervise all fumigations. In some instances there was refusal to submit to any fumigation, but in these isolated cases the routine of bringing them before the mayor's court was always resultful in good fumigation. It is safe to assert that not one single house in the Third and Fourth wards escaped thorough disinfection, and all those infected had two or more sulphurizations.

A vigorous crusade was at all times maintained against the stegomyia and culices generally; many ponds were drained and oiled, and many subcellars of houses, hastily constructed, and which permitted the accumulation of rain water and were a nidus for mosquitoes, were filled in with clean sand and drained. The city spared no expense to become clean, with the result that on

October 1 it was a most difficult matter to find a stegomyia, larval or adult, in the city, as reported to me by Passed Assistant Surgeon Berry of our Service.

The city of Gulfport, through her best business men, established and conducted throughout the epidemic two emergency hospitals, one for whites, the other for colored citizens. These hospitals relieved the situation frequently when the primary case in any new focus could be at once removed thereto and the premises thoroughly fumigated, and it is to this feature that can be ascribed the failure of the disease to get a foothold among the large population of negroes in the Third Ward.

HANDSBORO, MISS.

The occurrence of fever at Handsboro, a village of some 1,200 people, was not an unexpected one. Owing to its location it depended entirely upon Gulfport for its daily subsistence, and it was early decided that it would have to share in the fate of Gulfport and continue its association therewith. At no time were there any restrictions between these two cities. From Mississippi City it was always guarded until the occurrence of cases of fever within its borders, when all guard lines between the two places were discontinued. There were two isolated invasions of this village, one of them traceable to North Gulfport and the other to Mississippi City. The number of cases (11) was small, and the cases were of a mild type.

GULF COAST MARITIME PATROL.

Surgeon Wasdin, in his report, states as follows:

Upon my arrival at Gulfport there was an assemblage of the mayor and representative citizens of many of the neighboring coast cities for the purpose of devising plans for the establishment of a system of coast patrol to protect them against the introduction of the disease through vessels coming from New Orleans. It was imperatively necessary that this protection be established promptly and efficiently. My advent caused prompt demand that I assume control of the matter at once, and realizing that this patrol would essentially be one of interstate function I at once assented, wiring for authority to do so. Pending reply, I issued orders to the commanders of three gasoline launches, which were found already prepared by the assembled officials and citizens of the coast cities, and dispatched them to their duties which were to be performed at or near the junction of the waters of the States of Louisiana and Mississippi.

Later, by Bureau request on the Secretary of the Treasury, two revenue cutters were ordered to these waters for cooperation with the Public Health and Marine-Hospital Service, Surgeon Wasdin being the representative of the Service at Gulfport. Later, additional cutters were ordered to join this fleet, and Capt. Worth G. Ross, chief of the Revenue-Cutter Service, was directed by the Secretary to proceed to Gulfport to take charge of the fleet, arriving August 9.

The patrol fleet thus engaged consisted of the United States revenue cutters *Winona*, *Seminole*, *Forward*, *Hamilton*, *Alert*, and *Penrose*, and six smaller vessels which were chartered, and being placed in command of officers of the Revenue-Cutter Service and flying the Revenue-Cutter Service flag, were thus made legally revenue cutters. They were the *Grace*, *Carolyne*, *Noreta L.*, *Sonny Boy*, *Beulah D.*, and *Spy*. The total number of vessels boarded and examined or spoken by the patrol fleet was 1,923.

The services of this fleet were very valuable, for without the restrictions which they enforced the disease, doubtless, would have become widespread on the Gulf coast. Many vessels were apprehended, carrying passengers endeavoring to land at various points on

the Gulf coast, to whom the alternative was given of either returning to New Orleans or repairing to the United States quarantine station at Ship Island, to live out the required period of detention. Many vessels, with their passengers, elected the latter alternative.

SCRANTON AND MOSS POINT.

On September 27 Surgeon Wasdin received information through private sources of a highly suspicious fever at Scranton and Moss Point, and on the 28th visited Scranton and began investigations. In his report he gives a full description of the situation and his reasons for determining that the cases were yellow fever, of which he was firmly convinced. The local authorities, however, persisted in their assumption that the disease was dengue, and refused to adopt yellow-fever measures. The State authorities threatened to quarantine these localities by nonintercourse quarantine. In the meantime the disease spread very slowly, if at all, and the communities mentioned were practically isolated by the general quarantine restrictions of the neighboring States and localities, the train inspection service, etc., and it being late in the season no further action was taken.

YELLOW FEVER IN TAMPA AND PENSACOLA, FLA., 1905.

Report, in part, of Sanitary Inspector Jos. Y. Porter:

The history of the epidemic of yellow fever in Pensacola in 1905 very naturally embraces the consideration of the case of like character which occurred in West Tampa, as both events were produced by the same cause and came from a common source, New Orleans being the infecting point. Therefore, it seems proper to briefly refer to the case of yellow fever at West Tampa—the only one appearing in the southern peninsula—which was directly traced to New Orleans, before entering into a narrative of the epidemic at Pensacola.

On the 26th of July last the State health officer was notified of a "suspicious fever" in an Italian, who a few days before had come by rail direct from New Orleans to West Tampa. On arriving at Tampa on the morning of the 27th instant—the day after—he found that Victor Vitello, an Italian, had reached West Tampa *about* July 20, having left New Orleans *about* the 18th instant. The term "about" is used, for it never has been possible to fix accurately the date when this man *did* leave New Orleans or when he *did* arrive at West Tampa, because of his conflicting statements, but it is known that on Friday, the 21st, he desired medical attention. The first physician sent for, unfortunately, could not respond to the call, and the medical attention subsequently secured was from one illy capable to recognize the seriousness of the sickness from which it was afterwards found the man was suffering. The man stated that he was from New Orleans and came from a house where there were several sick with a fever and where one or more had died. Although the man was seen for three days by this doctor, who afterwards acknowledged to the State health officer that he knew yellow fever had been press reported at New Orleans, yet the coincidence of fever in an Italian from New Orleans, who had resided in a house where cases of a "doubtfnl fever" were said by the patient himself to have existed, never occurred to him as being strange or peculiar, and failed to arouse his suspicion or cause apprehension or uneasiness. The doctor discharged the man on the 24th as cured from a "bad cold."

On the 26th instant Dr. Charles W. Bartlett, local agent of the State board of health at Tampa, received an intimation that some one who had recently come from New Orleans was sick in West Tampa with a "fever." Much difficulty was experienced by Doctor Bartlett in locating the sick person. It seems to be quite certain from their actions that the Italian colony at Tampa and West Tampa suspected the nature of the man's illness and purposely suppressed

all facts connected with his sickness, and aimed to secrete the case. There is good reason to suppose also that the Italian colony at Tampa was likewise cognizant of the character of sickness then prevailing in New Orleans among their countrymen, and that this man who became frightened because of sickness and death in the tenement where he resided in New Orleans hastened to West Tampa where he had relatives and friends. Confirmatory of this hypothesis is the statement of the man himself that he sickened on the train after leaving New Orleans with "fever, nausea, and body aches."

Even after finding the sick man Doctor Bartlett was denied admittance to the room, and after forcing an entrance the man refused to talk, nor could he obtain any history from him until he threatened to arrest and put him in jail. Notwithstanding a history imperfectly and reluctantly given and with evident intention to deceive by misstating symptoms, yet by the appearance of the patient and other objective signs Doctor Bartlett was able to satisfy a diagnosis of yellow fever. The man was then in the fifth day of illness, as far as could be ascertained, and therefore the period when mosquitoes in the immediate surroundings could be infected had passed.

With the possibility of numbers of mosquitoes present which had bitten the Italian, Doctor Bartlett realized that prompt action was necessary to avert infection of not only the other members of the household after the twelve days' incubation, but also of a general distribution of the infection through the immediate neighborhood. Accordingly, the man was removed into another room and his bedroom screened and fumigated. After returning the patient to the fumigated room, the other rooms of the house, which was a one-story tenement building with four rooms and a "lean-to," were screened and fumigated. The buildings on each side of the premises were likewise screened at all openings and fumigated, and quantities of the mosquitoes of the stegomyia variety were destroyed.

This was the status of affairs when I reached Tampa on the morning of July 27 and assumed charge of the situation.

The future management of this case consisted in extending the area of possible infection to 300 feet in each direction from the originally infected house, and placing a sanitary cordon around the same. Nonimmunes to yellow fever were kept within this cordon, and persons living without were refused communication with persons within the restricted district. All dwellings within the cordon were not only screened, but occupants were provided with mosquito nets for night use. Daily and semidaily fumigation with pyrethrum powder and sulphur was made under medical supervision and the inmates of the cordoned territory were personally examined twice a day, their pulse and temperature being taken that any deviation from normal health might be noted and watched. The mayor of West Tampa was instructed to screen and oil all water containers, the State board of health providing material and help for this purpose. Ponds and pools of water which could not be drained were also oiled.

Under this management no other case of yellow fever developed, notwithstanding the fact that the members of the Italian's family were all nonimmunes and had free access to him at all times. The Italian was discharged about the 15th of August, and as the period had passed when it might be expected that infection would develop in those persons who may have been bitten by infected mosquitoes which had escaped fumigation and destruction, further restrictive measures were considered to be unnecessary and were removed.

As this case afforded the first opportunity to carry out the principle of management of yellow fever on the idea of mosquito transmission in the United States, directing such control of the disease to the destruction of the supposedly infected mosquito alone, it was indeed gratifying that notwithstanding mosquitoes had probably become infected when the Italian was discovered in West Tampa, no other cases occurred, because, knowing the habits of this species of mosquito, and that it scarcely if ever traveled far from original breeding places, the screening of the patient and fumigation of apartments had been so thoroughly done that all mosquitoes were destroyed which had probably bitten the Italian, and which would thereby have become the host for transmitting the disease, after twelve days of incubation. Such was evidently the case, and it is a matter of congratulation that the demonstration was so eminently successful and therefore the more convincing.

The material employed for screening purposes was cheese cloth; for having the advantage of being readily procurable, it also could be rapidly and easily placed over all openings. It must not be forgotten to mention, however, that a

small building in the roped-off block was especially fitted with wire-screened frames for windows and doors, and that at the entrance of the building a double-door (opening in opposite directions) vestibule was fitted.

The control of this case was under the direct management of the State board of health.

The next occurrence of yellow fever in the State was at Pensacola. On July 15 a cheap-rate railroad excursion, variously estimated to consist of from four to five hundred persons, left Pensacola for Mobile and New Orleans. Of this number the larger number went to New Orleans and remained there the time limit of the ticket—about four days. A great many Greek and Italian fruit dealers took advantage of this inexpensive method of visiting friends and relatives in New Orleans, in the quarter of the city afterwards known to have been infected with yellow fever at that time. Yellow fever was officially declared at New Orleans on July 22 on the statement of two physicians of Mobile, and immediately a quarantine inspection of all travelers from New Orleans for Florida was established at Flomaton, a small border town on the line between Florida and Alabama. Later on this inspection included passengers from the State of Mississippi, and in fact anyone desiring to enter Florida from any point to the north of the State was required to furnish a proper identification of whereabouts for the previous ten days to establish the fact of absence from any probably infected place for that period of time.

The fact of so many persons from Pensacola having visited New Orleans unwarned of the presence of yellow fever in that city, and returning to Pensacola without restrictions, gave Doctor Anderson, the local agent of the State board of health at Pensacola, a great deal of anxiety, which was the more intensified because, unregistered at the time of leaving, it was not possible to locate on their return those who had taken the excursion, which otherwise would have enabled him to have kept oversight of their health.

On August 6, at noon, Doctor Anderson received by telephone a hurried call for consultation on Mr. E. H. Hamn, an engineer on the steam tug *Simpson*.

* * * The peculiarities of this case are mentioned because it is now thought by a few of the medical men of Pensacola that Mr. Hamn died from yellow fever, and that his case, while atypical in many symptoms, yet, in the light of experience of veritable cases in the epidemic of yellow fever that followed, was sufficiently suspicious to justify an expression of doubt, notwithstanding the diagnosis of rabies.

After this, and from time to time, the local agent of the State board of health at Pensacola was called upon to investigate doubtful sicknesses and reported infractions of the quarantine restrictions on travel into Florida through Flomaton, and when these reports were confirmed the parties who had eluded the quarantine officials at Flomaton were sent to the detention camp for observation. Having the New Orleans excursion constantly in mind, the State health authority at Pensacola lived during the early days of August in constant fear and apprehension of possible developments.

On August 24 Doctor Anderson was asked to see in consultation a case of sickness at 126½ East Government street, thought to be dengue fever.

At this same visit Doctor Anderson learned that the husband of the lady had been taken ill about the same time as his wife, but had recovered. Nothing satisfactory denoting the positive character of these two (Cressap) cases could be learned, and a tentative plan of close observation was decided upon for the immediate neighborhood.

Late on the afternoon of August 28 Doctor Anderson informed the State health officer that, through a hint given him by a friend, he had discovered three Greeks who were ill, one sick in bed and two up, but weak;but all of whom, in his opinion, presented grave and doubtful symptoms of a suspicious fever, and he requested the State health officer to see these sick people with him.

There was no doubt in the mind of either the State health officer or of his assistant, Doctor Anderson, but that these three Greeks had well-marked cases of yellow fever.

As the source of infection could not then be traced, but was thought to be located within the square where the Cressaps had been sick, it was considered best for the protection of the rest of the city, in an endeavor to speedily suppress the disease, to institute a sanitary cordon, which would embrace enough of that portion of the city to include any other possible hidden cases, and then to begin a searching examination of all dwellings, by a house to house inspection, conducted under competent medical supervision.

The mayor of Pensacola was immediately notified of the situation and of the cases which had been discovered, and requested to early place the surveillance suggested by the State health officer into operation. The following announcement was made to the public, and information wired to the Surgeon-General and to neighboring State boards of health:

PENSACOLA, FLA., *August 29, 1905.*

"*To the public:*

"Three male Greeks with characteristic symptoms of yellow fever have been found in Pensacola * * * .

"As there is ample time to destroy any stegomyia which may have bitten these patients before they become infectible to the human, an earnest effort will be made to accomplish this object, and arrangements are being perfected by which the two squares in which these two cases have been found shall be screened and fumigated. A bidaily medical inspection of all persons living within this territory will be had, and any other cases will be cared for in screened rooms. The Louisville and Nashville Railroad and water transportation companies have been directed to sell tickets only to persons authorized by the State health authority, and no one living within 100 feet of the squares where the cases are located will be permitted to go elsewhere in the State, and the same is forbidden as a quarantine measure and restriction on travel.

"The restricted territory is hereby under police guard and is to be considered as within a sanitary cordon.

"The citizens of Pensacola are earnestly requested to screen their houses and destroy on the premises and in the home all breeding places for these insects. Use nets at night and fumigate sleeping rooms and lounging rooms daily, that mosquitoes may be killed. Maintain a calm, conservative course, attend to business, and, permitting the health authorities of city and State to attend to theirs, thus aid both in their effort to repeat successfully the incident of the West Tampa eradication.

"To the physicians of Pensacola: The State health officer earnestly asks that all fever cases be closely watched and studied, treating every case under a mosquito net and fumigating with pyrethrum powder every fever room after it has been sealed, and immediately notifying the State health authorities when any doubtful symptom, not well understood, arises in the course of treatment.

"With the united efforts of the people, it is hoped this incident may be soon closed.

"JOSEPH Y. PORTER,
"*State Health Officer of Florida.*"

As soon as possible a screening and fumigating force was organized with two young medical men of Pensacola in charge, and all dwellings within the sanitary cordon, which was bounded by Romana street on the north, Alcaniz on the east, Church street on the south, and a line drawn from Church street along Jefferson street through Cushman's alley to Romana street on the west, were screened as rapidly as possible and then fumigated.

At the same time the city sanitary force made a vigorous crusade against breeding places of mosquitoes, not only within the cordoned district, but elsewhere in the city, and for a time it looked as if the disease would be speedily suppressed and gotten rid of. This hoped-for deliverance from the plague was, unfortunately, not to be realized, for evidently before the restrictions were placed information had gotten out that such was to be done, and some who were living within the thought-to-be-infected area moved themselves and their belongings, without permission and without the knowledge of the city and State health authorities, and located elsewhere in town. Again, all guard service of this kind and sanitary cordons have their defects and can be broken unless the entire cooperation of the people, individually given, can be secured to prevent even an occasional "slipping out."

After three weeks the cases in the first infected district had so far decreased that it was thought it would be safely permissible to lift somewhat the restrictions against inmates of this porion of the city, and they were then permitted to go in and out during the daytime and attend to business, reporting each night to the sanitary patrolman on guard, so that in a general way the State health authorities could keep a surveillance on the health conditions of this section.

Soon afterwards, however, walking cases were discovered on the streets and persons in a dying condition who had not been reported sick, with no medical attention, caused a general distribution of "fever" throughout the entire city

by infected mosquitoes, and cases sprang up at different points, at the same time showing that the spread was general in character. The health authorities, both city and State, continued to urge the people to energetically push the warfare against mosquitoes and to fumigate and to screen their homes, offering the State health funds to effect the destruction of infected mosquitoes wherever cases of yellow fever were reported or found.

Insisting upon this policy of management as offering the only reasonable hope for suppressing the epidemic, and following this course of action, the disease finally came under control, and on the 19th of November quarantine was raised, cases having ceased to occur for several days before that period. It is a matter of note and well worthy of emphasis that the epidemic was stopped by this means, and that, too, before the appearance of frost.

Quarantine was not raised immediately after frost appeared, as formerly was the custom in yellow-fever management, but was kept on a sufficient length of time to warrant the belief that infection had practically been gotten rid of. It is due to a truthful history of this epidemic to state, however, that two cases of yellow fever occurred after quarantine restrictions were removed, one on November 15, the other on November 26, both fatal. Since this latter date no other cases have been reported in Pensacola, and it is quite certain none have occurred.

Besides the measures adopted to restrict the infection in the city and prevent a spread by an intramural or city sanitary cordon, the State health authorities also placed a sanitary guard around the entire city under direction of the sheriff of the county, to prohibit anyone leaving the city without permission, thus preventing possibly infected persons from carrying in their persons the disease to other portions of the State.

In addition to the land sanitary cordon, a water patrol of the harbor and bay was instituted by the Service, on the request of the State health authorities, and United States revenue-cutter officers were detailed for the duty, the Government providing a naphtha launch and revenue cutters for the service. The Public Health and Marine-Hospital Service also assisted the citizens of Pensacola by establishing on October 4 a detention camp near McDavid, Fla., close to the Florida-Alabama line, where refugees from Pensacola could be held under medical observation during the probable incubative period of yellow fever before being given pratique for other points either in Florida or elsewhere. Some 222 persons from Pensacola were thus cared for durng a period of twenty-one days. The camp, which was under the command of Surg. C. E. Banks, Public Health and Marine-Hospital Service, closed on October 27, and it is particularly pleasing to state that so careful was the scrutiny of all persons who were given this privilege that no infection was introduced into the camp.

It is well deserving of remark that, under the sanitary direction and management thus carried out, yellow fever was confined to Pensacola, and that outside of a radius of 20 miles around the city travel was unrestricted and uninterrupted and not interfered with with other parts of the State, and that the rest of Florida was not infected by Pensacola.

An interesting as well as instructive feature of management in the epidemic at Pensacola was the freedom from infection enjoyed by the nurses at St. Anthony's Hospital. The treatment of cases here was confined to the indigent, the homeless, and friendless class. A long ward, with smaller rooms opening into it, were all wire screened and then thoroughly fumigated to kill all mosquitoes. Only one entrance was given to these rooms, and that through a wire-screened vestibule cage with two doors opening in opposite directions. The nurses of the hospital were nonimmune young females. Although there were virulent cases of yellow fever treated in these wards, none of the nurses contracted the disease, nor did any other of the hospital force. As proving conclusively the correctness of the law of the transmission of yellow fever by the mosquito alone, mention is made of several cases of malarial fever, which in a hurried diagnosis were sent to the hospital under suspicion of yellow fever, and which were treated in the ward with the yellow fever cases and beside yellow fever patients, who recovered from the malarial attack, but never contracted yellow fever.

The amount of money expended by the State board of health of Florida for yellow-fever control and suppression was, for West Tampa, $2,508.88; for Pensacola, $30,191.08. These amounts, it must be understood, are exclusive of the expenditures of border train inspection (ten stations), construction and

maintenance of detention camps (3), etc., amounting to $11,355.56, making a total expenditure by the State of $44,055.52 for the entire yellow-fever management during 1905.

OPERATIONS AT CAMP MURRAY, McDAVID, NEAR PENSACOLA, FLA.

Surg. Charles E. Banks reports in part as follows:

On September 3, 1905, I was directed to proceed to Jacksonville, Fla., to await orders preliminary to the establishment of a detention camp near Flomaton, Ala.; from that point I was ordered to Montgomery, Ala., to await further orders, and on September 11 was directed to proceed to Flomaton and meet State Health Officer Joseph Y. Porter, of Florida, and select a site for a camp in Florida near the Alabama State line. These instructions were carried out, and in conjunction with that officer and the local health agent, a point was selected about 3 miles from Flomaton.

This choice, however, meeting with objections from State Health Officer Sanders of Alabama, and protests from the governor of the latter State, on account, as alleged, of its proximity to Alabama, was not approved, and after several other efforts, a desirable site was found at McDavid, Fla., 8 miles south of Flomaton on what was supposed to be Government land. This was afterwards found to be private property, and consent was secured for its temporary use.

The object of this camp was to provide for the exit of persons residing in or quarantined at Pensacola, where the yellow fever was rapidly assuming serious proportions. The approval of the site was given on September 26, and the estimate for the cost of establishing and maintaining same for one month, in amount, $3,000, was also approved.

Tents and other equipage, sufficient for one hundred persons, had been ordered by the Bureau to be sent from Camp Perry, Florida, and this material was in readiness at the point chosen when the work began. Unfortunately for the accomplishment of the work of construction in rapid time, a severe equinoctial storm broke on the day work was begun and prevailed during the greater part of the four days following, rendering outdoor labor practically impossible. A large force of laborers was thus kept idle, with the result of increasing the cost of construction over the estimate. Notwithstanding this serious interference, work was completed on the morning of October 4, and at noon a first lot of refugees was received. There were in all 223 admissions to the camp during its continuance.

The operation and daily routine of the camp do not seem to require any special mention beyond reference to the entire healthfulness of the refugees and employees. It is somewhat remarkable that with over 200 persons coming from a small city where yellow-fever cases were occurring at the time—between 20 and 30 new cases daily—no case should develop in the camp; nor was there any other form of sickness worthy of record among them.

The site was as healthful as the best of that well-known region in the woods. Excellent water was obtained by a driven well. There was practically a complete absence of all varieties of mosquito at and near the camp. A few anopheles and psorophora were captured, not exceeding half dozen of each during the entire occupancy of the site, and no stegomyia were seen or caught. It was thus practically certain that should yellow fever have developed there would have been no spread.

The temperature of all refugees was taken prior to departure at Pensacola and again on arrival at the camp. At first it was agreed with State Health Officer Porter that none should be started on a journey whose temperature was appreciably above normal. This was carried out for a few days, but this restriction was gradually limited to 37.77° C. (100° F.); persons showing in excess of this were required to wait further examination on the following day. It was also found that a considerable number showed this temperature and above on arrival at the camp, but after a rest of a few hours the thermometer would register a nearly normal temperature, indicating the temperature rise to be due to psychological or mental causes. And it was ever after deemed entirely safe to accept such persons for admission.

Temperatures of all in the camp were taken twice daily, and a complete record of the same kept. This forms an interesting study in the variations of temperatures of persons in good health, living under favorable conditions of

outdoor life. This does not seem to be the place for discussing the subject, and it may be passed with the remark that very few persons show an absolutely normal temperature.

On October 24 orders were received to close the camp on November 1, 1905, and no more refugees were admitted after the 25th to undergo the required detention period of seven days. For Florida points six days only were required.

It may not be inappropriate to refer not only to the satisfaction felt by the refugees in this measure adopted by the Service for the relief of conditions in Pensacola, but to the general expressions of approval that the conditions of camp life afforded them during the period of enforced detention. These expressions were both given verbally to the commanding officer and found further expression in commendatory resolutions published in the local papers. The camp thus served not only this excellent purpose, but was the means of furthering the dissemination of knowledge concerning the nature and transmission of yellow fever by the agency of the mosquito. Not the least of this was evident among the people of the section where the camp was located. From shunning it at first as a veritable lazaretto, they gradually became convinced that it was not a source of infection, and a great deal of old-time notions of the spread of the disease through fomites and fear of the person coming from infected localities was eradicated.

Passed Asst. Surg. R. H. von Ezdorf was assigned to duty as assistant and diagnostician in yellow fever, besides having charge of the personal health conditions of the camp population. Pharmacist William L. Stearns reported for duty on September 20.

The entire cost of the establishment and maintenance of the camp was $2,820.73, exclusive of return freight charges on the equipment.

RAILROAD INSPECTION SERVICE DURING THE YELLOW FEVER EPIDEMIC OF 1905.

Surg. G. B. Young reports in part as follows for the period extending from July 25 to October 27, together with some notes on such of the operations of the State and local quarantines as came under his observation:

This quarantine campaign presented many features which rendered it an epoch-making one, and consequently it would have been not without some value to have been able to trace the origin of these features, their development, and their results.

The introduction of the doctrine of the mosquito transmission of yellow fever into the popular conception of the disease, its far-reaching consequences in modifying quarantine proceedings, and the great change since 1897 and 1898 in the relations between the Service and the State and local health authorities were all matters deserving close study and full report, and for this preparation had been made by collecting a large mass of data covering quite completely every aspect of the question, and including a great quantity of matter impossible to replace.

On July 24, 1.30 p. m., orders were received as follows: "Proceed first train Jackson, Miss., confer with Hunter, secretary State board of health, and arrange system train inspection, and wire recommendation. Place no inspectors on duty until details are communicated to Bureau. Wire departure and arrival."

Upon arrival, July 25, I met Dr. J. F. Hunter, from whom I learned the details of the existing situation, which were as follows:

Upon the announcement of yellow fever in New Orleans, July 21, the State board of Mississippi had issued an ordinance quarantining the entire State against that city, and had taken such steps to make the order effective as the limited means available made possible.

Practically, however, they had to repose their main reliance upon the county and municipal quarantines, which sprang into existence everywhere within a few hours.

On the 23d, with the approval of the Bureau, an agreement had been made between Surgeon White, in charge of the Service operations in New Orleans, and Doctor Hunter, whereby the latter was to select and place on duty a limited number of train inspectors, who were to be paid by the Service.

These inspectors were to operate under Section I of the act of 1890, and were to prevent passengers from New Orleans from disembarking in Mississippi. Necessarily Doctor Hunter could not place all the men at once, so he was com-

pelled to have this done by various members of the State board residing in the different sections which the inspection was intended to cover.

This was the best that could be done at the time, but the result illustrated forcibly the necessity for unity of control in such measures and for the absence of the influence of local associations, if the highest efficiency is to be expected of appointees.

The men put on were in some instances unfit for the duty, and when fit were often so entirely subservient to either the influence or the fear of the local authorities as to greatly impair, or else destroy, their usefulness as representatives of either State or national authorities.

There had been no time for establishing unity of control. The men in each section looked to the State board member originally appointing them, and each section of territory was operating independently.

In addition to this, many of the towns and some of the counties had put on inspectors, who made runs of varying length over the roads entering their respective territories.

It resulted that some trains had three sets of inspectors aboard, each independent, no two with the same set of rules to enforce, and each demanding from the railroad people and passengers an instant obedience to their orders.

In order to make it clear how these conditions arose, and to understand the subsequent development of affairs, it is necessary here to give some brief explanation of the laws bearing on the imposition and conduct of quarantines in the States embraced in whole or in part in the territory covered.

1. Mississippi.—All authority to impose and enforce State quarantine resting theoretically in executive committee of three members of the State board, practically rested in secretary, and very fortunately for the State in the present instance, by reason of his holding a proxy of one of the other members.

The State board had power to do anything necessary for protection of State, in whole or in part, but had no power to prevent any county, city, town, or village from imposing such additional restrictions as they might see fit, except that no community could take such action as would close necessary access by railroads to coal chutes, water tanks, and junctions, nor could prevent the State board from passing any person or thing "through and beyond" any place, but the board is forbidden "to lodge or stop any person or thing" against the wishes of the local authorities.

These two last mentioned clauses have never been interpreted judicially, and consequently it is a matter of dispute as to whether or not the board can compel the authorities at junction points to permit the disembarkation of passengers who are destined for points beyond, or the setting out of freight cars for another road to pick up. In short, whether such a temporary, often hardly more than momentary, arrest in the passage of a person or thing "through" a place is a "lodging or stopping" in a place.

When, however, a locality is placed in quarantine on account of the prevalence of quarantinable disease the authority of the State board is absolute.

The board designates a State health officer to take charge, and all matters relating to the sanitary control within the place are under his jurisdiction. though, curiously enough, he can not by his own authority modify existing local orders as to quarantine against other places. For instance, in Vicksburg one of the Service acting assistants was arrested for violating the city quarantine by bringing into the city a case of yellow fever (an acting State health officer brought in for treatment), although at the time the city was pretty generally infected and was in charge of the State board.

2. Tennessee.—The law so far as concerns the authority of health boards is practically the same, except that the State board can exercise somewhat more nearly complete control of the actions of local quarantine authorities in such matters as the control of railroad junctions and the like.

3. Louisiana.—The law forbids a local or parish board from enacting regulations not approved by the State board, but during the past season the State board had so much on its hands that it was either unable or unwilling to enforce its authority.

It did do so when the action of the Calcasieu authorities suspended all traffic on the Southern Pacific, but it did not interfere when the authorities of the State capital, Baton Rouge, declined to accept the certificates of discharge from detention camps under the control of the Service.

In northern Louisiana, a portion of which was in my territory, the parishes and towns certainly did as they pleased.

Service operations in Alabama did not bring the Service, to any great extent, in contact with the State or local authorities, but as operations elsewhere were considerably affected by their rules, a word on this subject may not come amiss.

Practically all authority is vested in the State board, acting through its president, but this did not prevent some communities from having rules of their own.

The first thing noticeable upon arriving in Mississippi was the radical change that had taken place in the attitude of both authorities and general public toward the Service.

It amounted to a complete revolution in public sentiment, and simplified enormously the subsequent work.

In 1897 the Service received at the beginning the scantiest recognition, except in the infected places, when it came to the aid of the local authorities.

Recognition for its efficiency was won before that season was over, and the Service was able to enormously improve the quarantine conditions. Indeed the authorities of the various lines then covered all wrote at the end of the campaign that without Service assistance all traffic would have ceased; and thus was gained the confidence of many of the more progressive communities, but the general attitude was still one of suspicion, slightly tinctured with hostility.

The same was true to a lesser extent in 1898.

This year there was found an overwhelming sentiment in our favor.

Often local conditions, the influence of some individual commercial considerations, or the terror born of a dreadful experience in the past, prevented the acceptance of Service camps or inspection certificates; but even in the most extreme of such cases the efficiency of the work, as far as it went, was recognized, its aid was welcomed, and its representatives were courteously treated and given all reasonable facilities for the execution of their work. Curiously enough the only State that refused these reasonable facilities was Illinois.

The morning after my arrival a conference was had with Doctor Hunter and the authorities of the Illinois Central and Yazoo and Mississippi Valley roads in regard to inspection arrangements, and later in the day they went to Vicksburg and saw some of the city authorities in regard to the regulation of steamboat traffic, and the officials of the Vicksburg, Shreveport and Pacific, and the Alabama and Vicksburg with reference to regulation of traffic from Louisiana.

It was found, as always, that the Service could absolutely count on the assistance and full support of practically all the great transportation companies, and it is desired here to bear testimony to the promptness with which the railroad people acceded to requests for what were often very expensive changes in their arrangements. the effectiveness of their cooperation, and indebtedness to them for making possible much that was accomplished.

Upon returning to Jackson the afternoon of the 26th, I spent a considerable time canvassing the situation with Doctor Hunter, and early next morning went on a special with the general superintendent of the Illinois Central Railroad to Hanrahan Junction, La., 7 miles from New Orleans, where I met Surgeon White and went with him while he selected a site for a detention camp near by, and then arranged with him and the railroad people for the relay of northbound cars and crews at the junction, for, while I had no authority as yet to assume control of the inspection service, it was thought proper to accede to Doctor Hunter's request and assume supervision of it in behalf of the State and to act for him in completing the necessary arrangements.

I returned to Jackson during the night, and at once entered into active cooperation with the State board.

I desire to give for the most part only a general view of the conditions we had to meet, the methods employed, and their results.

First, then, as to conditions. Persons living outside of infectible territories have not the slightest conception of the effect of the announcement that yellow fever has appeared in some place within such territory. People outside this zone read of the quarantines which result, with but a faint understanding of their true significance. They hear occasionally of some absurdity or some horror caused by the enforcement of foolish or cruel quarantine rules, and laugh or shudder, as the case may be.

Every sort and condition of men or women interrupted in the performance of every imaginable act filled every town, crowded every train in vain effort to get from place to place, and burdened the mails, the telegraph wires, and the long-distance phones with the stories of their losses, their disappointments, and their griefs.

No one but those who have seen all this can conceive what it means.

The State quarantined at first only against the city of New Orleans, thus suspending only the passenger traffic with that city, but the towns and villages went much further. Men who went out of town to work a few hours in the vicinity were sometimes refused permission to reenter town the same evening. People who had gone to neighboring towns for the day were many weeks getting home.

It resulted from our former efforts that when this year Doctor Hunter put on inspectors to cover the more important lines of travel, both the principles and the methods of such work were generally understood, and some experienced men were at once available. It is true that local quarantines sprang up everywhere as before, with all the paraphernalia of guards, inspectors, passes, etc., but in number they did not equal those of previous years and the extent of their requirements was much reduced.

RESULTS.

In the face of the difficulties, with the cooperation and assistance of the State and local authorities, there were achieved the following results:

First. Passenger traffic was kept moving safely and with vastly less inconvenience than ever known before, upon some 3,200 miles of railway, in portions of six States, preventing almost incalculable loss and untold distress.

Second. Much of the contemptible petty robbery of the ignorant, practiced at certain points by means of certificate and notorial fees, was broken up.

Third. It was rendered almost impossible for an honest man to enter infectible territory unless his recent antecedents precluded his being a source of danger, and as nearly as possible did the same for the dishonest ones, detecting and turning back dozens of persons who sought entrance to infectible territory on fraudulent papers.

Fourth. Although passenger traffic went on with a freedom hitherto unknown, there was not a single instance in which yellow fever developed in territory covered by the work, except where infection had been introduced before work was begun.

Fifth. Invaluable aid was given when the fever did appear, assisting in controlling it locally, caring for the suffering and providing means of escape for the refugees.

Sixth. The confidence was won of the majority of the intelligent people in the soundness of the methods and the disinterestedness of Service purposes; and by means of constant missionary work, speeches, mass meetings, interviews, letters, etc., the Service greatly aided in securing wide acceptance of the mosquito doctrine, and so, largely made it possible for Doctor Hunter to do what was one of the most epoch-making acts in epidemic history, viz, raise all State quarantines October 21, and present to the world the astonishing picture of Jackson, Meridian, and other places, holding unrestricted intercourse with Vicksburg, Natchez, and other towns where for weeks to come yellow fever cases continued to appear from day to day.

As already stated, I acceded to Doctor Hunter's request to assume the immediate direction of the organization and conduct of the State's inspection system, in order that preparation might be made for the eventual transfer to the Service control.

An exception was made of the Louisville and Nashville Railroad along the coast, the control of which was placed in the hands of Surgeon Wasdin, representing the Service in the coast towns.

On taking charge, men were found running on the Illinois Central trains from McComb, Miss., to Memphis, Tenn.; on the Yazoo and Mississippi Valley from Wilson to Vicksburg; on the Shreveport, Vicksburg and Pacific from Shreveport to Vicksburg; on the Alabama and Vicksburg from Vicksburg to Jackson; on the New Orleans and Northeastern from Picayune to Meridian, and a few on disconnected portions of other systems.

These men had received instructions to allow no one to disembark at any point in Mississippi unless they could produce a certificate signed by a State, county, or municipal health officer that they had not been exposed to infection from yellow fever for ten days last preceding date of issue, and to refuse permission for any one from any point in Louisiana to disembark under any consideration. The very enlightened State board of Mississippi had not only accepted the doctrine of the transmission of yellow fever solely by mosquitoes, but had the courage of its convictions, and from the first made no attempt to

segregate passengers from infected territories nor to put any obstacles in the way of interstate traffic, and the same is true of the Tennessee board. Unfortunately, many of the towns, cities, and even States, were less enlightened.

There was one relay station, viz, at Picayune, on New Orleans and Northeastern. All the trains from New Orleans stopped there, and new trains with new crews were made up there for northbound traffic, and all passengers and baggage were transferred to them. The freight crews were also changed there.

Memphis, at this time, was open to passengers to and from New Orleans, and complaint was already general that people were coming from New Orleans to Memphis and thence traveling back into Mississippi. Inspectors were therefore placed on the 'Frisco from Memphis via Holly Springs to the Alabama line and on the Yazoo and Mississippi Valley from Vicksburg to Memphis. No attempt was made to control the branch and subsidiary lines, because with the main lines covered people could not get from them to the branches.

A relay station was established at Harahan, 7 miles north of New Orleans, shuttle trains were run between Harahan and New Orleans, and all trains on Illinois Central and Yazoo and Mississippi Valley were made up there. The only exception was that the baggage cars were run into the city and fumigated there under direction of Surgeon White before coming out. All crews were quartered at the company's hotel at the yards near Harahan, and no one was permitted to go into the city. Acting Asst. Surg. B. J. Cook, who had served in former epidemic work and was immune, was stationed at Harahan to supervise the relay.

On the 28th a case of yellow fever was reported at Lumberton, Miss., and while no danger was apprehended therefrom, it was deemed best in the interests of the public peace of mind to put inspectors on the Gulf and Ship Island from Gulfport to Jackson.

To say that there was confusion at this time in all the social, business, and transportation affairs, and in the workings of the various State, county, city, and village quarantines, is much too mild. The conditions were beyond comprehension by those not on the ground.

I urged upon Doctor Hunter the importance of immediate statement by the board of its principles in regard to freight, and after conference with Governor Vardaman drafted the following ordinance, which was at once published by the board on July 29:

"ORDINANCE No. 6.

"JULY 29, 1905.

"While the State board of health of the State of Mississippi believes that there is no danger of the transmission of yellow fever by freight, and therefore does not intend to impose any restrictions on freight in general, it thinks the circumstances surrounding the shipment of bananas are such as may possibly admit of the transportation of infected mosquitoes, and therefore it is hereby ordered that cars containing bananas shall not be opened in the State of Mississippi."

This cleared up matters a good deal. A good many places kept up their unnecessary quarantines against freight, but for the most part they rapidly fell into disuse.

August 1 a case of fever was reported at Shreveport, La. I started that night via Vicksburg to arrange a relay just east of Shreveport, but the whole country along the Vicksburg, Shreveport and Pacific Railroad in Louisiana was disturbed, and some distance west of Monroe it was thought best to turn the train around and come back for fear of getting tied up. The relay, however, was established the next day, and continued in operation until the development of fever at Tallulah, and consequent closure of most of the towns in Louisiana, and later in Vicksburg compelled us to withdraw to the incline on west bank of Mississippi, opposite that city.

On August 7 I received telegraphic orders to wire a plan for extension of the inspection service, and on the 9th received orders to take formal charge of same. In the interval from August 3 to 7 I was engaged in actively traveling about, making educational addresses, arranging for better facilities at junctions, etc., conducting negotiations for the acceptance of disinfection and detention certificates and perfecting plans for the future.

On the 7th Memphis instituted a rigid quarantine, admitting no one from anywhere without a permit. This complicated the work very much, and necessitated a revision of the runs on the Illinois Central.

On assuming command of the operations of the Service at Jackson on August 9 an office was opened in the Norvelle House.

The organization consisted of Acting Asst. Surgs. W. E. Addis, detailed from station at Evansville; R. P. Nall, detailed from station at Louisville, and A. G. Love, who served as immediate assistants; Acting Asst. Surg. William Krauss, expert diagnostician; Acting Asst. Surg. J. Waldauer, in charge of inspectors centering in Vicksburg; Acting Asst. Surg. B. J. Cook, in charge of relay at Harahan, and 27 inspectors, some lay and some medical. The number of inspectors was afterward increased to 39.

By arrangement with the railways a good many of the trains had been discontinued, and such other changes made in the schedules as would simplify the problem of covering all the trains.

Owing to the fact that trains are subject to all sorts of delays, it is impossible to set in motion any organization for their supervision that would not continually be thrown into confusion, unless provision is made for giving it a flexibility adaptable to all conditions, and for keeping all its working parts under constant control.

A system was accordingly established, based on the "train sheet" of the chief dispatcher's office, by means of which the starting, stopping, meeting points, connections, etc., of each train was shown, its whereabouts at any hour readily ascertained, and any emergency caused by accident, delay, missed connection, illness of inspectors, sudden change in the quarantine situation, and the like could be met. Extra men were stationed at Memphis, Vicksburg, Meridian, Jackson, and McComb.

The inspectors were divided into groups, and each was relieved for twenty-four hours every seven days, but was required to keep within reach of long-distance telephone or telegraph so as to be instantly available.

By these means, and by utilizing the net work of connecting lines and branches to transfer men from one line to another when emergencies arose, it was possible to finish the season with the record of only four trains left uncovered.

When it is remembered that when fully at work the service handled forty-eight trains daily on 3,200 miles of track on nine roads in five States this is certainly not a bad record.

The territory as a whole was divided into districts, and these assigned to care of an assistant. The plan was that each road should be gone over by an assistant as nearly as possible every seven days; two assistants to be away at a time, and one always at main office in Jackson.

The passenger lists were put up in books of alternate white and yellow paper with interleaved carbon sheet, so that a record was preserved of every through passenger handled. Strictly intrastate and local passengers were not listed.

Badges were made of a red, white, and blue ribbon 3 inches wide, bearing the words printed in black letters, "Inspector, U. S. Public Health and Marine-Hospital Service." These proved much more satisfactory than the metal badges formerly used by the Service, being conspicuous enough to quickly attract attention, and legible at some little distance.

As far as concerned the intrastate business, of course, the inspector had theoretically no occasion to inspect a passenger's credentials at the time of embarking, his duty being simply to see that no such passengers without proper credentials were disembarked; but under the section of the law directing that the Service "Shall cooperate with and aid State and municipal boards of health in the enforcement of the rules and regulations of such boards," entire charge was taken of the intrastate inspection, and so the rule was to compel all persons to embark at one entrance and to inspect their credentials before they did so.

On the 14th I was in Memphis to arrange with Dr. Heber Jones, president of the city board, and Dr. J. L. Andrews, chief quarantine officer, for the adjustment of troubles arising between Service and local inspectors over local regulations. A modus vivendi was readily established.

At the request of Dr. J. Albright, secretary and executive of the Tennessee board, the question was taken up of further extension of the system in western and southeastern Tennessee.

On the 16th yellow fever was reported at Mississippi City, and the passenger service was therefore reduced on the Gulf and Ship Island Railroad, Gulfport to Jackson, to one train a day each way and a relay station was established at McHenry, and it was arranged that passengers from the coast via Jackson for the north and east should be held in screened coaches at Jackson pending arrival of their trains.

On the 18th there was submitted by wire, in response to Bureau orders, a plan for the extension of the Service desired by Tennessee, and on the 19th authority was received to make the extension. On the 21st I met Doctor Albright in Jackson, Tenn., and arranged the details.

By the 26th the points along Yazoo and Mississippi Valley from Kenner to Baton Rouge were pretty generally infected and the gateway via Vicksburg being closed, it became necessary to arrange a way out for the people from Louisiana and southwestern Mississippi.

This was done by arranging that a special train service be put on from New Orleans to Baton Rouge, and running through without stop until north of that point. The trains to be used by people in Louisiana north of that point and in Mississippi, and the crews relayed south of the Louisiana line. The passengers were then routed via Harriston and Jackson.

On the 29th I was asked by the commercial and other organizations of Natchez to arrange for Service to assume charge of the situation in Natchez, and the same request was made by Governor Vardaman on behalf of the State. At my suggestion these gentlemen took the matter up with the Surgeon-General.

The same night yellow fever was reported at Vicksburg.

This necessitated a very general rearrangement. Combined with the fever at Talulah, and the absolute panic along the Vicksburg, Shreveport and Pacific, it compelled abandonment of all attempt at control west of the Mississippi. On the Yazoo and Mississippi Valley Railroad a relay north of Vicksburg was established at Blakely, and south of the city at Stouts. These were in operation by the 31st.

On the 28th the State of Mississippi quarantined against Whistler and Mobile, Ala. I proceeded on the 29th to the territory immediately involved, and established relays on the Mobile and Ohio at State line and on the Mobile, Kansas City and Jackson at Latonia.

The night before leaving Jackson we handled several carloads of refugees from Natchez, holding them in screened coaches until arrival of the north-bound train.

This was the only lot of Natchez people that developed fever en route. One case developed just after the train left Natchez, and died a day or two later in Chicago.

At this time, by Bureau orders, I received each evening a report by telegraph from all infected places starting refugees north, giving numbers of passengers, their destinations, and routes.

The authorities of all cities concerned were then wired, advising them of the number of people coming. Alabama having quarantined against Mississippi, the following was issued:

"The State of Alabama has quarantined against the entire State of Mississippi. You should therefore warn all passengers who wish to board the train in your territory, destined to points in Alabama, that the Alabama authorities will not permit them to disembark in the State of Alabama.

"At present Mississippi includes in infected territory, in addition to the whole State of Louisiana, the towns of Gulfport, Mississippi City, Pearlington, Hansboro, Natchez, and Vicksburg, Miss., and Pensacola, Fla., the tier of counties along Yazoo and Mississippi Valley Railroad as follows: Warren, Clairborne, Jefferson, Franklin, Adams, and Wilkinson. In addition the State of Mississippi has quarantined against Mobile and Whistler, Ala. Passengers from these points must be treated as if from infected territory."

By the latter part of September practically all the towns which had required permits from local authorities for the disembarkation of passengers had abandoned the practice, and came to rely upon the work of the inspectors. The great majority had done this from the first, but only a few of those who had not done so failed to accept the work by the middle to latter part of September, and this in the face of the much more widespread infection which shows that the Service had won the public confidence to a considerable extent. During October Service work, while requiring constant attention, especially in the handling of refugees, had settled down into fairly well-established routine.

On the 22d the Mississippi board issued an order lifting all quarantine restrictions after 6 p. m. on the 23d, and all Service men were called in except those on trains running from Natchez, and from Vicksburg into Jackson. The reason for continuing these was, that the Jackson authorities were a little afraid to open for communication with infected towns so close at hand, with fever cases still occurring, and there was danger that if the work were discontinued entirely, the town would close and precipitate similar action by neighboring towns.

These last men were withdrawn on the 26th, and the memorable campaign of 1905 was over.

A few days were consumed in closing up business, and the office finally closed October 31.

INSPECTION AND CERTIFICATION OF RAILWAY PASSENGERS AT ATLANTA, GA.

Surg. C. P. Wertenbaker reports in part as follows:

In obedience to cabled orders of July 28, 1905, I left Habana, Cuba, August 1, for Tampa, Fla., for conference with State Health Officer J. Y. Porter, a case of yellow fever having been reported at Tampa.

While at Tampa I received orders from the Surgeon-General to proceed to Montgomery, Ala., to investigate the health conditions there, a case of yellow fever having developed in a refugee from Louisiana. I arrived in Montgomery August 4, investigated and reported on the conditions, and in obedience to additional orders proceeded to Atlanta, Ga., for the purpose of ascertaining the number of refugees from infected districts in and around Atlanta, and reporting on the advisibility of establishing an office for the issue of certificates to travelers going South, showing that they had not been in territory infected by yellow fever for at least six days, the object being to prevent refugees from infected territory coming through to Atlanta and then going south into infectible territory until the period of incubation of the disease had passed.

As a result of my investigations I learned that there were a large number of refugees in and around Atlanta, variously estimated from 500 to 5,000, and every train from the infected districts brought others.

As the States of Mississippi, Alabama, Texas, Arkansas, and Tennessee had put on rigid quarantines, and as Atlanta had thrown open her doors and invited refugees to come, Atlanta was the first haven of refuge that was open to persons leaving the infected districts, consequently the majority of the refugees stopped in and around Atlanta.

These facts were reported to the Bureau, and the establishment of an office at Atlanta for the issue of certificates recommended.

In accordance with that recommendation the Surgeon-General directed me to open such an office and commence the issue of certificates. I secured the grand and petit jury rooms in the Federal building, and on the morning of August 10, 1905, commenced the issue of certificates.

Attention is called to some special features in regard to the nature of the certificate and the precautions adopted to secure identification of the individual bearing it.

In former epidemics, with the ordinary methods of identification consisting of description and signature, it was no uncommon thing for travelers to transfer their certificates, when they no longer needed them, to other persons. In order to put a stop to this practice and at the same time furnish a positive and easy method of identification of the individual, the method was adopted of placing the mark of the ball of the right thumb on the certificate in addition to the description and signature of the bearer.

The ease with which the thumb mark can be made, and the ease with which any individual, not an expert, can determine the difference between or identity of thumb marks, and the fact that no two thumbs ever make the same mark, combine to make it an ideal identification for a health certificate.

The method of making the thumb mark is simplicity itself. The ink pad commonly used for inking rubber stamps is used. The ball of the right thumb is pressed firmly but lightly on the inked surface of the pad, and then pressed at a designated spot on the certificate, leaving the impression of the thumb on the paper.

In case of doubt as to the identity of the holder of the certificate it is only necessary for the inspector to require the individual to reproduce the thumb mark on the certificate, and this can only be done by the person who made the original mark.

Travelers, knowing that the certificate contains positive means of identification and that at any moment one may be required to duplicate the thumb mark, and to be detected in an attempt to travel on a certificate issued to some one else would be considered a violation of the United States quarantine laws and regulations, with all that that means, would be sufficient to make one think twice before attempting to use a certificate not his own.

It will be noted that it lies with the individual bearing the certificate to prove his identity.

The certificates were only issued on evidence, and the personal statement of the individual as to his whereabouts for the previous six to ten days were never taken without corroborative evidence. Affidavits alone were not accepted as evidence.

The office was opened at 9 o'clock on August 10, 1905, and was finally closed at 5 p. m. November 15, 1905, having issued nearly 8,000 certificates.

I made it a rule to personally sign every certificate that was issued.

On September 1 a case of yellow fever developed in a refugee from Pensacola, who was promptly removed from the city, and who died September 5.

Following this case the State board of health of Georgia instituted a State quarantine requiring all persons entering the State to show ten days' absence from any infected territory. This quarantine was removed on November 1. With the placing of the Georgia State quarantine this influx of refugees practically ceased, and the certificates issued thereafter were to persons who lived in Atlanta or came from northern points.

Upon the opening of the Atlanta office the State health officer of Florida announced that all persons entering Florida from Atlanta must bear its certificate showing ten days' absence from any infected territory. This order was in force until November 13, 1905, when no further certification of passengers was deemed necessary.

The care that was exercised in the issue of the certificates soon became known, and as a result of it they were accepted without question wherever certificates were received. The States of Alabama and Texas did not accept certificates, but relied on the personal statement of the individual supported by affidavit.

INSPECTION OF RAILROADS AND STEAMSHIPS AT NORFOLK, PORTSMOUTH, NEWPORT NEWS, AND RICHMOND, VA.

Surg. H. W. Sawtelle reports, in part, as follows:

In accordance with letter of August 14, 1905, directing me to proceed to Norfolk, Portsmouth, Newport News, and elsewhere in Virginia as directed from time to time, for the purpose of conferring and cooperating with State and local health authorities relative to the measures taken to prevent the introduction of yellow fever into the State, I arrived at Norfolk August 15, and had a conference with Dr. James G. Riddick, the mayor and president of the board of health, and other officials; also the health officer of Portsmouth. From these gentlemen it was learned that, in view of the yellow-fever situation in New Orleans, a general cleaning up was in progress, particularly in Norfolk. Under the direction of inspectors special attention was directed to streets and alleys, defective plumbing, screening, and oiling of tanks and other water containers on or about buildings, removal of weeds and grass and bushes from premises, draining and liming of cellars, filling up of abandoned cisterns, etc.

In addition to the usual inspection of vessels arriving in port the quarantine commission of the district of Elizabeth River, which includes the cities of Norfolk, Portsmouth, and Berkeley, had, under a special State law enacted a few years ago, inaugurated an inspection of railroad trains arriving from the South, under the direction of the local quarantine medical officer, to prevent yellow-fever refugees from entering the city unless they presented satisfactory evidence of having been absent from infected places six days.

Soon thereafter, on account of the large number of refugees en route for different places in the North and in view of the fact that it was ascertained that some people from New Orleans intended to visit Norfolk via Washington or Baltimore, the Washington and Baltimore steamers were also inspected, all refugees from yellow-fever districts being required to satisfy the inspecting officers that they had been absent from any infected point for the regulation period, namely, six days, or to proceeding farther north. Moreover, anticipating the possible requirements later on, it was decided that any cases of yellow fever developing here would be immediately transferred to Craney Island, which is situated about 3 miles above Norfolk, and preparation was made there for the isolation and care of a limited number of patients. This island belongs to the Government, and some years ago it was loaned to the cities of Norfolk and Portsmouth for a small pox hospital site.

In reference to the train inspections, the Virginia State board of health had decided to establish inspections at the State border for the following roads, namely, Southern Railroad at Danville, Seaboard Air Line at Norlina, Norfolk and Western at Norfolk and Bristol, Chesapeake and Ohio at Clifton Forge, and Atlantic Coast Line at Emporium and Suffolk.

It was found, however, to be impracticable to organize the proposed inspection, as the board had no funds available for such purposes. The expenses for the inspection of trains at Norfolk were paid for by the various railroad companies under the law referred to above, and the State board desired to place an inspection at the State boundary line, which would protect the whole State, with a view to discontinuing the inspection at Norfolk, which was made in the interests of Norfolk, Portsmouth, and Berkeley especially. A meeting of the railroad and health officials was therefore held to consider the matter in question, and the representatives of the railroads offered to pay for the border inspection, as recommended by the State board in place of the one in force at Norfolk, but they objected to paying the expenses for a double inspection when it appeared that only one was necessary. The Norfolk quarantine commission, however, formally declined to yield to the proposition to withdraw their inspection, and therefore no further action was taken in the matter.

Newport News was visited on August 18, and it was found that no action had been taken there relative to an inspection of trains over the Chesapeake and Ohio Railroad or for the inspection of steamers running between Richmond and Norfolk, the board of health there being likewise without funds for exigency work. Passengers over this road bound for Norfolk changed here by transfer boat, and other trains ran to Fortress Monroe, where passengers connected by steamer for Washington, Baltimore, and New York; and it being apparent that no action would be taken there by State or local authorities, and as further delay was deemed inadvisable, with your approval Acting Asst. Surg. A. C. Jones was detailed to inspect the trains and steamers, and he was placed on duty August 22, 1905, with compensation at $3 per day. He was instructed to require refugees to give satisfactory evidence of six days' absence from infected territory or to proceed to points farther north.

On August 31 Richmond was visited and a conference was held with representatives of the State board of health, the mayor, and health officer, from whom it was learned that no action had been taken by State or local authorities to prevent refugees from infected places from stopping in the city, owing mainly to the fact that no funds were available for such purposes, especially as far as the State board was concerned. Upon considering the conditions here, the danger of infection appeared to be remote, and it was not deemed advisable to recommend that an inspection of trains be inaugurated on the Virginia border line at the expense of the Government, unless it should appear later on to be absolutely necessary by reason of developments in connection with the epidemic in the South. But it was found that on account of the rigid inspection at the various ports comparatively few yellow-fever refugees arrived in Norfolk, Portsmouth, Newport News, or Richmond during the epidemic, and there were no suspicious cases of fever among the number.

During the exigency health certificates were issued by the different health officers at these ports to southbound passengers without charge upon application. The inspections at Norfolk, Portsmouth, Newport News, and Richmond were discontinued on or prior to October 18, 1905, the epidemic being practically over.

MEASURES TAKEN AT CAIRO, ILL., TO PREVENT THE INTRODUCTION OF YELLOW FEVER.

Passed Asst. Surg. J. W. Amesse reports as follows:

As directed in Bureau letter, I have the honor to report upon my observations at Cairo, Ill., of measures taken by the local and State authorities to prevent the introduction of yellow fever from infected districts, up to the date of my departure for New Orleans:

A foreword with reference to Cairo's previous experiences with yellow fever may go far not only toward justifying the severity of the quarantine adopted, but also in explaining the widespread trepidation existing the entire summer in a community several hundred miles from the nearest focus of infection.

Prior to 1878 there is no record of yellow fever at this point, but in the memorable epidemic of that year it was rapidly conveyed along the avenues of

the teeming river traffic, extending to the lower reaches of the Ohio about midsummer. In June several mysterious deaths at Cairo excited the alarm of a number of citizens, who, not satisfied with the diagnosis of malaria, promptly departed for the more salubrious lake region.

For reasons unaccountable to them, but which, in the light of present knowledge are perfectly clear, their expectations were not realized; there was no continuation of sudden deaths following sharp febrile attacks, and public confidence, for the moment, was restored. Within three weeks, however, the secondary infection spread as a storm over the entire city. The panic-stricken people exhausted the resources of the railway lines and crowded into every conceivable vehicle of transportation. Business was forgotten. Among the few thousand remaining there were about 100 deaths. The records do not show the morbidity, but it is safe to assume there were at least 500 cases. One of those who succumbed was the officer in command of the Marine-Hospital Service.

For many years Cairo suffered, in both her material and numerical growth, the effects of this visitation. It was quite generally conceded that no possible barrier, in the way of quarantine and isolation, could prevent a repetition of the trials of this disastrous summer should yellow fever again become epidemic in contiguous Southern States.

That this belief was well founded was not shown till nearly twenty years later, when, in the epidemic of 1897, the disease appeared shortly after its detection in New Orleans, in spite of a rather rigorous quarantine directed against that city. Fortunately, on this occasion the early cases appeared among river boatmen, who were cared for at the marine hospital, and the disease recognized by Dr. Juan Guiteras. Attempts were made to trace the infection without result. There were no secondary cases. With these lessons in mind it was but natural that the announcement of the reappearance of yellow fever in New Orleans in July last should have been received at Cairo with considerable foreboding.

As the gateway from the infected region to a large and populous section of the Middle West, it was recognized that the inevitable exodus north would daily expose this point, which lies at least 150 miles south of the limits of infectible territory, and constitutes the distributing center for five railway systems.

In this emergency the State board of health, unhandicapped by niggardly appropriations, promptly resorted to those measures it deemed warranted in restricting and supervising communication between Cairo and all points in Louisiana and Mississippi. The services of seven competent physicians, under the direction of Dr. George T. Palmer, assistant secretary of the State board, were retained to meet all incoming trains, inspect crews and passengers, examine the credentials of those destined for Cairo, and, with the aid of guards and police provided by the sanitary authorities, place under surveillance, in coaches provided by the Illinois Central Railroad, all persons unprovided with certificates from national, State, or municipal health authorities. These passengers were then sent north of the boundary of the stegomyia zone, which, in this instance, was the line of the Baltimore and Ohio Railroad, extending from Vincennes, Ind., to East St. Louis, Ill.

Steamers from points farther south were required to wait in midstream for inspection before proceeding to the wharves, where guards were stationed to prevent the landing of boatmen and passengers.

Shortly after my arrival, on August 11, in view of the extension of yellow fever to points in Mississippi and the generally less hopeful view of the situation, in addition to the observations of the inspectors that refugees and others from infected towns could, by circuitous routes, enter Cairo from the north, the secretary of the Illinois State board of heaalth issued the following proclamation:

"CAIRO, ILL., *August 19, 1905.*

"To all transportation companies by land and rail, and to all others whom it may concern:

"The Illinois State board of health hereby orders that, until further notice, no passengers from any points in the States of Louisiana or Mississippi, or any points in other States in which yellow fever is reported, shall be permitted to leave trains or boats at any point in the State of Illinois south of the line of the Baltimore and Ohio Southwestern Railroad, running from East St. Louis on the west to Vincennes, Ind., on the east, until ten days after such passengers have left the States of Louisiana or Mississippi, or points in other

States in which yellow fever is reported, and then only when provided with certificates of health signed by national, State, county, or municipal health officers.

"No passengers from any States in which yellow fever is reported shall be carried to any point in Illinois south of the line above described unless provided with certificates of health signed by national, State, county, or municipal health officers.

"The city of Cairo is hereby declared to be quarantined against all points north, south, east, and west. No person shall be permitted to enter the city of Cairo from any point unless provided with health certificates signed by national, State, county, or municipal health officers, it being understood that no health certificates issued in the States of Louisiana or Mississippi, or at other points in other States in which yellow fever has been reported, shall be accepted in the city of Cairo until ten days after the persons holding said certificates have left the States of Louisiana or Mississippi, or points in other States in which yellow fever is reported.

"J. A. EGAN, M. D.,
"Secretary and Executive Officer."

On the same date the common council, yielding to urgent appeals of the press and many responsible citizens, and recognizing that Cairo, by reason of its sanitary unfitness and the widespread distribution of stegomyiæ, was ripe for an epidemic, passed an emergency ordinance making it compulsory for all persons entering the city to first secure a permit from the local board of health. Identification, with proof that for ten days previous the holder had not been in infected districts, was demanded.

These regulations were carried out by local and State forces jointly, the city undertaking to police all roads leading into the corporate limits and supervise the ferries from the Kentucky and Missouri shore, while the State officials conducted the inspection service on trains and steamers.

Some friction resulted, but, on the whole, the quarantine laws were executed with fairness and judgment—certainly without favoritism.

On October 3, some weeks before Cairo raised its quarantine, I was ordered to New Orleans, leaving in charge of the marine hospital Acting Asst. Surg. T. H. D. Griffitts, who was instructed to keep in touch with sanitary affairs until the close of season.

EXPERT INVESTIGATION SERVICE.

During the epidemic several officers were called upon to visit localities suspected of being infected with yellow fever, to make positive diagnosis, and to give advice to the local authorities as to how to proceed in the emergency. The services of these officers were extremely valuable, not only in showing positively in some instances that the disease was absolutely present and arousing the local health authorities and people to a realization of their danger and the necessity of energetic action, but also in relieving some places of the suspicion of being infected. The findings and decisions of these officers in these cases were invariably accepted as authoritative.

With regard to Memphis, Tenn., and Mobile, Ala., in particular, persistent rumors prevailed that the yellow fever existed, and the decisive opinion of the officer detailed to investigate that they were absolutely free from yellow fever was of great benefit to these cities.

Many of the officers on duty at New Orleans during the epidemic were sent to various places in the parishes of Louisiana, and into other States for purposes similar to those above mentioned. Their visits extended as far north as Oklahoma and the Indian Territory. In neither of these Territories, however, was yellow fever found, although certain cases were long in doubt and caused apprehension lest the yellow fever, by this indirect route, might be introduced into Texas.

But it is impracticable to give in detail an account of all the service thus rendered. Special mention, however, is necessary of the inspection service of this character rendered by Passed Assistant Surgeon Goldberger; by Surg. Eugene Wasdin, in addition to his supervisory duties at Gulfport, Miss.; and by Passed Asst. Surg. Edward Francis, at Mobile.

Following is the copy of instructions, dated July 26, 1905, to Passed Assistant Surgeon Goldberger outlining his duties:

LETTER OF INSTRUCTIONS.

Having this day reported at the Bureau, Washington, D. C., in accordance with telegraphic instructions of the 24th instant, you are hereby directed to take the first available train and proceed to Vicksburg, Miss., and Shreveport, La., confer with the local health authorities at these places, and make a full investigation of the health conditions obtaining, with a view to determining whether any cases presenting symptoms of yellow fever now exist in these cities. The results of your investigations should then be communicated to the Bureau.

Having completed this duty, you are directed then to visit any places in the States of Louisiana and Mississippi, in which rumors of the presence of yellow fever may come to your knowledge, or be furnished you by the Bureau, by State health officers, or by the service officer in charge of epidemic measures in New Orleans.

Your duty while making these investigations will not only be to determine the presence or absence of yellow fever in the places visited, but also to conduct a campaign of education among the medical profession and the laity with whom you may come in contact, upon the importance of screening all cases of febrile diseases from the access of mosquitoes until a positive diagnosis is made, and upon methods for the destruction and prevention of the propogation of these insects. To this end you are directed to familiarize yourself with the Bureau publications upon these subjects, as found in the annual reports, public health reports, and reprints of the Service.

You will also carry with you your microscope, accessories and stains for the demonstration of malarial disorders, and for purposes of differential diagnosis.

You will render to the Bureau a full report upon the completion of your investigations at any given point, and will report by wire your arrival, and upon leaving your next proposed site of investigation.

Your status while upon this detail will be that of special temporary duty, and unless instructed to the contrary you will not enter the city of New Orleans in order to avoid embarrassment from local quarantines.

Following is a summarized report of sanitary inspection of places in Louisiana, Mississippi, Texas, Alabama, Georgia, and Arkansas:

OPERATIONS OF PASSED ASSISTANT SURGEON GOLDBERGER.

Pursuant to orders in Bureau letter of July 26, 1905, and of the several telegrams subsequent thereto he visited, in the order given, the following points: Vicksburg, Miss.; Morgan City, La.; Lake Charles, La.; Hot Springs, Ark.; Shreveport, La.; Marshall, Tex.; Mansfield, La.; Alexandria, La.; Lake Providence, La.; Natchez, Miss.; Memphis, Tenn.; Bainbridge, Ga.; and Mobile, Ala. In general terms, these visits were made in order to determine the presence or absence of yellow fever, to act as diagnostician in doubtful or disputed cases of fever, and to aid the local health authorities in formulating and applying appropriate prophylactic and suppressive measures against such infection as threatened to or already had gained admission.

He assisted in the diagnosis of yellow fever in Morgan City, in the detention camp at Shreveport, and at Alexandria, La.

A formal inspection of Hot Springs, Ark., of Memphis, Tenn., of the vicinity of Bainbridge, Ga., and of the city of Mobile failed to disclose the presence of yellow fever. In the inspection of Bainbridge and vicinity he had the assistance of Acting Asst. Surg. Parrish Smith.

His visits to the other points mentioned were short, and except at Alexandria and Natchez were for the purpose of clearing up doubts as to suspicious cases of fever or for the purpose of explaining the mosquito doctrine in the transmission of disease.

At Alexandria and at Natchez he was in advisory control of the sanitation; in the former city his connection with the local board of health lasted ten days, during which time an effective sanitary organization was established. His connection with the authorities at Natchez lasted only some twenty-four hours, being relieved by Passed Assistant Surgeon Lavinder, in order that he might proceed to Memphis to make the inspection previously mentioned.

In making the inspection of a city for yellow fever it has generally been considered sufficient to study the death records and from these to determine whether there has been any unusual mortality, both relative and absolute; to consult with the local practitioners and with them visit such cases as they might be pleased to show, both in private practice and in hospital.

As the result of his experience in this line of work Doctor Goldberger has found an additional and very valuable means of attaining the object of the inspection. This consists in making a house-to-house inspection of the neighborhood in which a death has occurred as shown by the mortuary records. The inspection may be limited to the deaths from causes which may be regarded as suspicious, such as malaria, gastric cancer, uremia, or cerebral congestion, particularly in young adults. In smaller cities it is practicable to investigate in this manner all deaths known to have occurred during the six weeks immediately prior to the date of the inquiry and even in larger cities this plan may be pursued, but necessitates several trained assistants in order to cover the ground expeditiously. In this way both primary and secondary cases may be discovered before a medical attendant has been called.

In outlining sanitary measures he tried always to show how these naturally and rationally flowed from the mosquito doctrine of transmission. He pointed out that an application of rational measures of prophylaxis and suppression required a clear knowledge of the bionomics of the stegomyia calopus mosquito and of the known facts in the life cycle of the hypothetic yellow-fever parasite.

With this knowledge as a basis, oiling, fumigating, screening, and inspecting squads were organized. These squads were instructed in their duties, which were to attack and destroy the larval stage of the mosquito's life with oil or by screening, or both, where destruction of the water receptacle was not practicable, to destroy the adult insect by fumigation and to ferret out all sick at the earliest practicable moment. By these means there were fulfilled the prime indications in yellow-fever sanitation, namely, (1) to destroy the insect intermediary, and (2) to prevent such insects as might escape destruction from gaining access to the sick.

OPERATIONS OF SURGEON WASDIN.

In numerous instances Surgeon Wasdin was called upon to make diagnosis of suspicious cases in neighboring localities. As he states in his report, this was by no means the least of his duties, and in many ways the most important, for in those cases where a positive diagnosis of yellow fever was made it insured the taking of proper precautionary measures at once, and in those where a negative diagnosis was made it prevented unnecessary excitement.

Surgeon Wasdin states as follows regarding this particular duty:

Besides the personal inspections of the coast cities and their suburbs, as heretofore detailed, it became my duty to act frequently as diagnostician in other localities of the State of Mississippi, upon the request of the governor.

On July 28 I went by invitation to Lumberton, Miss., and diagnosed the disease in an Italian who had been exposed at New Orleans, and at the earnest request of the mayor of the town I at once instituted the application of the principles of quarantine, and the disease was at once stamped out. On August 3 I was called to Sumrall, Miss., on a like errand, the case being in an Italian also exposed at New Orleans. Similar measures were at once taken to prevent its spread, and the disease at once stamped out.

On August 29 I was summoned to Pearlington, Miss., but pressure of work compelled me to send Acting Asst. Surg. Charles Le Baron, and under his direction and vigorous application of principles the fever was soon stamped out. On August 29 I was summoned by the governor of the State to decide the question of diagnosis at Natchez, a most important railroad center, and I there found a number of cases of yellow fever. At the solicitation of its mayor I addressed a large and cultivated audience at the opera house, giving them a succinct account of the stegomyia and its lessons. After my immediate departure a further detail to this city was made from the Bureau. I was also invited to decide a case at Yazoo City, Miss., and Ovisburg, Miss., and found them negative.

On August 27, I was at Taylorsville, Miss., by invitation, to decide a suspicious case and found it negative. On two occasions I was invited to Hattiesburg, Miss., to decide in doubtful cases, and in both instances found them negative. On two occasions, at the request of the governor of the State, I visited Jackson, to decide in doubtful cases, and in each of these found negatively.

OPERATIONS OF PASSED ASSISTANT SURGEON FRANCIS.

During the epidemic the question was raised whether mosquitoes infested the bunches of bananas arriving from South American ports, and Passed Asst. Surg. Edward Francis, at Mobile, was directed to make careful examination of banana cargoes as they arrived, with a view to determining this point. At the same time he was directed to make a report upon the measures adopted to prevent the infection of Mobile and vicinity from the infected territory in Louisiana.

Doctor Francis reports, in part, as follows:

Referring to Bureau letter instructing me to report upon my observations in Mobile and vicinity relative to measures adopted to prevent the introduction of yellow fever, and upon the transmission of mosquitoes by the fruit steamers and their cargoes, I beg leave to state that during the past summer I inspected the cargoes of the following-named steamers:

September 5, steamship *Fort Morgan*, from Bocos del Toro; September 6, steamship *Geo. Dumas*, from Ceiba; September 7, steamship *Colombia*, from Bocos del Toro; September 14, steamship *Espana*, from Ceiba; September 15, steamship *Ansalm*, from Bocos del Toro; September 15, steamship *Espana*, from Limon; September 18, steamship *Hiram*, from Ceiba; September 19, steamship *Imperator*, from Bluefields; September 19, steamship *Fort Morgan*, from Bocos del Toro; September 20, steamship *John Wilson*, from Ceiba.

These steamers all carried green bananas. While each steamer was dis-

charging its bananas at the wharf I went aboard and remained a half hour in the hold, and as the bunches of bananas were being handled I watched for mosquitoes, but never saw a single mosquito in the hold of any ship.

There is a small gnat which is always present on the bananas in the hold; it has red spots on its head and the laborers know it as the banana gnat.

Amateurs might readily call this gnat a mosquito. I think this mistake was made once this summer, for I was told by some friends who were present when the hatch was opened "that the mosquitoes swarmed out from the hold." I then inspected the ship, and after a diligent search could find no mosquitoes, but found plenty of the red-headed gnats.

One might readily make the same mistake in the examination of cars loaded with bananas.

At the wharf I did not inspect the living quarters of the ships for mosquitoes.

On invitation of Dr. Henry Goldthwaite, health and executive officer of the Mobile Bay quarantine board, I did visit the quarantine station eight times during the summer, and often saw the fumigation of living quarters on the ships with sulphur. I regarded the fumigation as efficient to kill any mosquitoes which might have been in the quarters.

The cargoes were not fumigated, as sulphur blackens the bananas and renders them unmarketable. In the handling of the ship's crew and passengers at the quarantine station the quarantine officers took no chances on the introduction of yellow fever, and if they erred it was on the side of safety.

Mississippi Sound was patrolled at the Mississippi-Alabama State line by two boats to prevent boats arriving from Mississippi by way of Grants Pass.

On the line between Baldwin County, Ala., and Florida, there were quarantine guards at all bridges, ferries, and roads. There were launches in Perdido Bay and there were mounted guards patrolling the coast from Perdido Bay to Mobile Bay.

Mobile County was protected on the north by guards at the wagon roads. There was a relay station at the Louisville and Nashville Railroad, below Grand Bay station near the Mississippi-Alabama State line on Alabama soil. At this station all passenger coaches and train crews were turned back. The baggage cars and express cars having been fumigated in New Orleans and not opened until 20 miles out of New Orleans, were allowed to pass the relay station, together with the engine.

The passengers were transferred to fresh cars and carried through Alabama without being permitted to get off. Any passenger wishing to enter Alabama over the northern or eastern border was required to fill out and sign a blank, giving his starting point and destination, and to swear before the quarantine officer on the train that he had not been in infected territory for seven days previously.

NATIONAL MARITIME QUARANTINE STATIONS.

Following are condensed reports from thirty-two national maritime quarantine stations:

Eastport, Me., quarantine.—Post-office and telegraphic address, Eastport, Me. Acting Asst. Surg. E. M. Small in charge.

Two vessels were spoken and passed; 987 steamers and 70 sailing vessels were inspected and passed. There were 23,630 crew on steamers and 412 on sailing vessels, and 36,921 passengers on steamers.

Portland quarantine.—Post-office and telegraphic address, Portland, Me. Surg. P. C. Kalloch in command, under orders of December 21, 1901.

Steamers inspected and passed, 103; sailing vessels, 8; sailing vessel disinfected, 1; crew on steamers, 6,511; on sailing vessels, 113; passengers on steamers, 2,748.

Perth Amboy quarantine.—Post-office and telegraphic address, Perth Amboy, N. J. Passed Asst. Surg. W. A. Korn in command, under orders of July 12, 1904.

Forty-four vessels were inspected and passed, of which 38 were steam vessels and 6 were sailing vessels. One thousand one hundred

and ten persons were inspected, of whom 1,052 were members of crews of steam vessels, 57 members of crews of sailing vessels, and 1 passenger. Eighteen steam vessels were fumigated. During the year no cases of quarantinable disease came under observation.

Reedy Island quarantine.—Post-office address, Port Penn, Del. Telegraphic address Reedy Island, Delaware. Passed Asst. Surg. H. W. Wickes in command, under orders of March 12, 1903.

One thousand one hundred and eleven vessels were inspected and passed, of which 982 were steamers and 129 sail vessels; a total of 65,363 persons were inspected, of which 36,801 were crews of steamers, 1,766 crews of sail vessels, 26,796 passengers on steamers, and 16 passengers on sail vessels. Four vessels were disinfected, as follows: British steamship *Barnton*, from Colon, on account of tropical malaria; American steamship *Shawmut*, from Tampa, on account of enteric fever; the British steamship *Burrsfield*, from Bombay, with a cargo of ore, on account of plague, with crew of 13 Europeans and 38 Lascars. Thirty-eight days after sailing from Bombay one of the natives died of a disease the symptoms of which were suggestive of pneumonic plague; eight days later another death occurred, with symptoms resembling the septicemic type of the disease; on April 9, while at the station, a third native sickened, and after an illness of forty-eight hours died. In addition to the fatal cases, there were three or more men sick during the voyage. Immediately after arrival cultures were made, and guinea pigs inoculated with material obtained from two suspects, which were taken to the hygienic laboratory for further study. The crew was landed on the disinfecting pier, bathed, and their clothing and effects steamed, and the sick isolated. Sulphurization of the holds, storerooms, and living apartments was the process of fumigation mainly relied upon, though other measures were resorted to in cleaning the vessel. The vessel was released and proceeded to the port of Philadelphia on April 15, the crew having been detained for observation. The diagnosis of plague was confirmed by the Bureau. The vessel returned to the station after having discharged cargo, and the entire crew, with the exception of the patient under treatment for bubonic plague, were placed on board after nine days' observation, and the vessel released. The patient detained ultimately recovered. The British steamship *Lincairn* also arrived from Huelva. There was one case of convalesing varioloid among the crew. The entire crew was vaccinated and the vessel remanded to the Delaware Breakwater quarantine station for treatment.

Delaware Breakwater quarantine.—Post-office and telegraphic address, Lewes, Del. Passed Asst. Surg. L. P. H. Bahrenburg in command, under orders of July 9, 1904.

One hundred and four steamers were inspected and passed; 47 sailing vessels inspected and passed; 3,281 crew on steamers, 780 on sailing vessels, and 57 passengers on steamers, and 13 on sailing vessels.

Alexandria, Va., quarantine.—Post-office and telegraph address, Alexandria, Va. Acting Asst. Surg. Arthur Snowden in charge.

Thirteen sailing vessels, with 97 crew and 6 passengers, were inspected and passed.

Cape Charles quarantine.—Post-office and telegraphic address, Fort Monroe, Va. Asst. Surg. G. L. Collins in command, under orders of March 14, 1906.

Four hundred and seventy-nine steamers and 31 sailing vessels were inspected and passed; 37 steamers and 3 sailing vessels were disinfected; 20,474 crew on steamers, 307 crew on sailing vessels, and 449 passengers on steamers.

Cape Fear quarantine.—Post-office and telegraphic address, Southport, N. C. Passed Asst. Surg. E. K. Sprague in command, under official orders of January 9, 1906.

Twenty-eight steamers and 20 sailing vessels were inspected and passed; 3 steamers were disinfected; there were 803 crew on steamers, 200 crew on sailing vessels, and 4 passengers on steamers and 1 passenger on sailing vessel.

Savannah quarantine.—Post-office and telegraphic address, Savannah, Ga. Acting Asst. Surg. William J. Linley in charge.

Ninety-five vessels were spoken and passed; 123 steamers and 18 sailing vessels inspected and passed; 7 steamers and 10 sailing vessels disinfected; there were crew on steamers 3,936, on sailing vessels 270; passengers on steamers 27, on sailing vessels 2.

South Atlantic quarantine.—Post-office address, Inverness, Ga. Telegraphic address, Darien, Ga. Passed Asst. Surg. M. K. Gwyn in command under orders of May 24, 1905.

Fifteen steamers and 10 sailing vessels were inspected and passed; 2 steamers and 2 sailing vessels disinfected; there were 373 crew on steamers, 158 on sailing vessels.

Brunswick quarantine.—Post-office and telegraphic address, Brunswick, Ga. Assist. Surg. R. D. Spratt in command under orders of Feruary 21, 1906.

Seventeen vessels were spoken and passed; 46 steamers and 46 sailing vessels inspected and passed; 2 steamers and 13 sailing vessels disinfected; there were 1,381 crew on steamers, 601 on sailing vessels, and 8 passengers on steamers, 6 on sailing vessels.

Tampa Bay quarantine.—Post-office address, Fort de Soto, Fla. Telegraphic address, Tampa, Fla. Passed Asst. Surg. T. D. Berry in command under orders of December 27, 1905.

Forty-one vessels were spoken and passed; 88 steamers and 72 sailing vessels inspected and passed; 20 steamers and 17 sailing vessels disinfected; there were 2,713 crew on steamers, 684 on sailing vessels, with 26 passengers. Ten sick were taken from vessels; there were 46 vessels from yellow-fever ports, and 5 vessels from plague ports.

Cumberland Sound quarantine.—Post-office and telegraphic address, Fernandina, Fla. Act. Asst. Surg. J. L. Horsey in charge.

One hundred and fifty-nine vessels were spoken and passed; 48 steamers and 33 sailing vessels were inspected and passed, and 5 sailing vessels disinfected. There were 2,014 crew on steamers, 1,375 on sailing vessels, with 72 passengers on steamers, and 21 on sailing vessels.

St. Johns River inspection station.—Post-office and telegraphic address, Mayport, Fla. Acting Asst. Surg. George Macaulay in charge.

Two hundred and fifty-three vessels were spoken and passed; 9 steamers and 47 sailing vessels were inspected and passed; there were 1,107 crew on steamers, 1,776 on sailing vessels; 18 passengers on steamers, and 41 on sailing vessels.

Key West quarantine.—Post-office and telegraphic address, Key West, Fla. Acting Asst. Surg. S. D. W. Light in charge.

Three hundred and ninety-six steamers and 60 sailing vessels inspected and passed; 23 steamers and 7 sailing vessels disinfected; 15,586 crew on steamers, 538 on sailing vessels, 13,751 passengers on steamers, 439 on sailing vessels.

Boca Grande quarantine.—Post-office and telegraphic address, Punta Gorda, Fla. Acting Asst. Surg. W. Barnes in charge.

Vessels spoken and passed 37; steamers inspected and passed 4, schooners 7; schooners inspected and detained 3.

St. George Sound quarantine (East and West Pass).—Post-office and telegraphic address, Carrabelle, Fla. Acting Asst. Surg. B. B. Blount in charge.

Vessels spoken and passed 1; steamers inspected and passed 1, sailing vessels 54; sailing vessels disinfected 1; crew on steamers 28, on sailing vessels 490.

Santa Rosa quarantine.—Post-office and telegraphic address, Pensacola, Fla. Acting Asst. Surg. R. C. White in charge.

Vessels boarded and passed 17; vessels spoken and passed 14; steamers inspected and passed 133, sailing vessels 91; steamers disinfected 76; sailing vessels 84; crew on steamers 5,964, on sailing vessels 1,792; passengers on steamers 43, on sailing vessels 46; stowaways on steamers 6.

Biscayne Bay quarantine.—Post-office and telegraphic address, Miami, Fla. Acting Asst. Surg. James M. Jackson, jr., in charge.

Vessels spoken and passed 695; steamers inspected and passed 43, sailing vessels 33; crew on steamers 2,252, on sailing vessels 217; passengers on steamers 2,474, on sailing vessels 408.

Port Inglis quarantine.—Post-office and telegraphic address, Dunnellon, Fla. Sanitary Inspector William Griffith in charge.

Steamers entering Port Inglis quarantine from foreign ports 48, from domestic ports 18; sailing vessels from foreign ports 3.

Pascagoula quarantine.—Post-office and telegraphic address, Pascagoula, Miss. Acting Asst. Surg. B. F. Duke in charge.

Vessels spoken and passed 30; sailing vessels inspected and passed 195; crew on sailing vessels 1,654, passengers on sailing vessels 16.

Gulf quarantine.—Post-office and telegraphic address, Biloxi, Miss. Passed Asst. Surg. C. W. Wille, in command, under orders of March 24, 1905.

Throughout the summer of 1905 this station and its personnel were taxed to their utmost capacity because of the prevalence of yellow fever, in epidemic form, along the Gulf coast, together with an unusual number of infected ships from foreign ports.

The location of the station on Ship Island, 12 miles off the Mississippi coast, is an admirable one from a strategic standpoint, as was demonstrated when 15 steam craft, 201 sailing vessels and 85 barges from infected points of the mainland arrived for quarantine treatment before proceeding to clean or noninfected territory. On these vessels 5 cases of fever were observed, 3 of which proved to be mild cases of yellow fever.

Throughout the epidemic there were maintained practically 3 distinct anchorages—first, the quarantine station proper; second, ballast grounds; third, the West End loading anchorage, where all ships,

barges, etc., were kept free of infection by disinfection, daily inspections, etc.

Three hundred and five sea-going vessels (96 steamers, 209 sailing vessels) were inspected, and of these 107 were disinfected. Upon these vessels a total of 4,452 persons were inspected. In all, 12 vessels infected with yellow fever arrived, 5 of which were remanded from Mobile quarantine station, 3 from coastwise ports, 3 from foreign ports direct, and 1 from Dry Tortugas, the infection of which could not be traced. In the hospitals there were treated the cases of yellow fever from the vessels above named, 9 cases malarial fever, 2 enteric fever and 1 tapeworm, 1 inflammation of tonsils, 1 fracture radius, 1 inflammation stomach, and, in addition to these, there were 28 cases malarial fever, 9 malarial cachexia, 1 bubo, 1 tubercle of lungs, 1 rheumatism acute, and 1 beriberi, which were diagnosed on vessels, treated and allowed to proceed with the ship to its destination.

San Diego quarantine.—Post-office and telegraphic address, San Diego, Cal. Acting Asst. Surg. W. W. McKay in charge.

Vessels spoken and passed, 6; steamers inspected and passed, 104; sailing vessels, 16; crew on steamers, 2,208; on sailing vessels, 274; passengers on steamers, 1,485; on sailing vessels, 4.

Los Angeles quarantine.—Post-office and telegraphic address, Los Angeles, Cal. Surg. J. O. Cobb in command, under orders of November 29, 1902. Also subports of Port Los Angeles, San Pedro, and Santa Barbara.

Seventeen vessels were inspected and passed.

San Francisco quarantine.—Post-office and telegraphic address, Angel Island, Cal. Passed Asst. Surg. W. C. Hobdy in command, under orders of January 26, 1906.

On April 18, 1906, this station was visited by an earthquake, which did much damage to chimneys, roofs, walls in the office and quarters, furniture, and to stores. The electric-light plant was injured, and the new telephone cable was damaged and temporarily put out of use. The launch ways were twisted out of shape and the launch was injured. During the four days following the earthquake, the quarantine tug did good work in the harbor of San Francisco in rescuing the panic-stricken refugees, and delivering them and their effects to places of safety. Nearly a thousand owe their deliverance from imminent peril to such efforts, and the work was done without injury to anyone or delay to commerce. The tug delivered supplies to thousands of refugees in camps, and, in addition, she represented armed force for a part of one day, and with a guard on board commandeered other tugs whose services were needed. Upon rumors of smallpox, the facilities of the station were put at the disposal of the boards of health, and four or five cases were received and cared for. Thirty-five other cases, most of them measles, were received and cared for.

Vessels spoken and passed, 46; steamers inspected and passed, 370; sailing vessels, 255; steamers disinfected, 29, sailing vessels, 13; crew on steamers, 36,332; on sailing vessels, 5,138; passengers on steamers, 48,491, on sailing vessels, 2,073.

Eureka quarantine.—Post-office and telegraphic address, Eureka, Cal. Acting Asst. Surg. C. V. Thompson in charge.

Steamers inspected and passed, 4, sailing vessels, 16; crew on steamers, 197; on sailing vessels, 149; passengers on steamers, 468.

Columbia River quarantine (and Oregon subports, Marshfield, Newport, Florence, and Gardner).—Post-office and telegraphic address, Astoria, Oreg. Asst. Surg. F. H. McKeon in temporary charge, under orders of January 18, 1906.

Vessels spoken and passed, 100; steamers inspected and passed, 46; sailing vessels, 52; steamers disinfected, 2; crew on steamers, 2,024, on sailing vessels, 1,155; passengers on steamers, 29; on sailing vessels, 385.

Port Townsend quarantine (and subports Port Angeles and South Bend, Wash.).—Telegraphic and post-office address, Port Townsend, Wash. Passed Asst. Surg. J. H. Oakley, in command under orders of May 28, 1903.

Vessels spoken and passed, 1; steamers inspected and passed, 161; sailing vessels, 168; steamers disinfected, 5; sailing vessels, 15; crew on steamers, 13,766, on sailing vessels, 3,377; passengers on steamers, 17,679, on sailing vessels, 88.

Grays Harbor quarantine.—Post-office and telegraphic address, Hoquiam, Wash. Acting Asst. Surg. T. C. Frary, in charge.

Sailing vessels inspected and passed, 26; crew on sailing vessels, 272; passengers on sailing vessels, 23.

Texas-Mexican border quarantine.—The work of inspection along this border at El Paso, Eagle Pass, and Laredo has continued during the fiscal year. The work consists in inspection of passengers arriving by rail at these points for quarantinable disease, in the vaccination of those requiring the same under the quarantine regulations of the United States, in the disinfection of soiled linen used in the Pullman car service passing through these points, and in the fumigation of such merchandise in carloads as requires the process under the quarantine regulations.

The effect of these operations on the border is to expedite travel, to permit the operation of through trains between the City of Mexico and other Mexican points and points in the United States, and to prevent annoying detention of passengers unless the same is absolutely required in the interest of the public health.

DENGUE IN THE UNITED STATES.

During the summer of 1895 dengue was reported from various parts of the United States, and was the cause of considerable apprehension on account of the prevalence of yellow fever in certain parts of the South, and the fear of an inadequate differential diagnosis. Inspections were therefore ordered and made of Jacksonville, Fla., Brunswick, Ga., and, as has elsewhere been related, of Mobile, Ala., with the result these places were cleared of the suspicion of possible yellow fever.

SERVICE AID IN SMALLPOX.

In addition to the prevalence of smallpox in various parts of the United States, as is mentioned in another portion of this report, there were reports of a prevalence of the disease in various parts of the State of West Virginia, and a request for the services of an expert diagnostician in Preston and Monongalia counties in that State, there being differences in the diagnosis of a prevailing disease. Passed Asst. Surg. Joseph Goldberger was directed to proceed to

these points, and reported that the disease was smallpox and advised the local authorities as to the preventive and restrictive measures to be taken to prevent the spread of the disease.

SPECIAL QUARANTINE CONFERENCE WITH THE AUTHORITIES OF THE GULF STATES.

March 27, 1906, a telegram was received, signed by Dr. George R. Tabor, State health officer of Texas; Dr. C. H. Irion, president Louisiana State board of health; Dr. Rhett Goode, president quarantine board of Mobile Bay; Dr. Henry Goldthwaite, health officer, quarantine board of Mobile Bay; Dr. J. F. Hunter, secretary Mississippi State board of health; W. R. Thompson, Texas State quarantine officer; W. G. Armstrong, member Louisiana State board of health; A. J. Perkins, member Louisiana State board of health, requesting a conference at New Orleans not later than April 15 to discuss maritime quarantine in order to arrive at an agreement for uniform regulations for Gulf ports, and requesting me to attend this meeting in person. A reply was sent on the 28th of March, stating it was impossible for me to be absent from Washington at the time indicated, and that therefore the conference requested was called for Monday, April 16, to be held in Washington, and under the law there would be one delegate from each State.

Accordingly, on April 16 the conference was held in the office of the Surgeon-General. The following were in attendance: Dr. George R. Tabor, Texas; Dr. C. H. Irion, Louisiana; Dr. Henry Goldthwaite, Alabama; Dr. J. Y. Porter, Florida; and Surgeon-General Wyman and Assistant Surgeon-General Geddings of the Public Health and Marine-Hospital Service.

It soon developed that there was no desire to discuss interstate quarantine, and that the request was made with reference to maritime quarantine and to settle some points concerning which there seemed to be a difference in administration between the National and State governments. These related principally to the quarantine against Habana—Mississippi and Florida (under national control), and the regulations of the Public Health and Marine-Hospital Service not requiring the same restraints as were being imposed by Louisiana and Texas.

It was agreed, therefore, that the topics for discussion should be as follows: 1. Quarantine against Cuban ports. 2. How long a time should elapse after the last reported case at an infected port before the port should be considered noninfected? 3. How long should detention be in the case of a vessel arriving from an infected port? 4. Treatment of vessels at Mexican ports, and period of time which should elapse before they are given pratique at Gulf ports.

With regard to topic No. 1, the reasons for the then attitude of the Service toward Habana and Cuba were fully explained, and facts which had been learned regarding conditions in Habana and Cuba were given in detail, and it was made plain by the representatives of the Public Health and Marine-Hospital Service in the conference that with conditions as they then existed it was not deemed necessary to change the present practice, but that a change would be made immediately upon necessity becoming apparent.

Regarding the second topic, free discussion upon this matter resulted in the final decision that twenty-one days should be considered the minimum period which should pass after the last case of yellow fever in a port before said port could be considered free from the infection of yellow fever, but that this period, according to conditions, might be extended.

The principles involved in topic No. 3 were thoroughly gone over, and the several opinions expressed carefully examined into and discussed, and finally it was decided that the United States quarantine regulations as at present existing, which require five days as a minimum of detention, should not be changed.

The principal ports of Mexico under discussion in the consideration of topic No. 4, were Veracruz, Tampico, and Progresso. The treatment of vessels at Mexican ports was that required by the national regulations. The Surgeon-General explained to the conference that the Service had an officer at Veracruz and another at Progreso to enforce the Treasury regulations with regard to vessels and persons leaving said ports for the United States, and stated that at Tampico no yellow fever has been reported or suspected this year, and it was deemed unnecessary to locate an officer there. With regard to the period of time which should elapse before vessels from Mexican ports are given pratique at gulf ports, this depends upon the conditions in the Mexican ports and is covered by the regulations and the discussion of topic No. 2.

This conference was called in accordance with act of Congress approved July 1, 1902, section 7, and was the second special conference held under this act, the first being the special conference in 1903 over the plague situation in California. Other conferences held under this section have been the regular annual conferences required by the law.

NATIONAL QUARANTINE LAW OF 1906.

In my last annual report reference was made to the conference of governors and other representatives of the Southern States, held in Chattanooga, Tenn., November 9 and 10, 1905, and to the resolutions passed by this conference favoring a strictly national quarantine law. The resolutions in full were published in the annual report for 1905.

Congress at its last session enacted the following law:

AN ACT To further protect the public health and make more effective the national quarantine.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury shall have the control, direction, and management of all quarantine stations, grounds, and anchorages established by authority of the United States, and as soon as practicable after the approval of this Act shall select and designate such suitable places for them and establish the same at such points on or near the coast line of the United States or the border of the United States and a foreign country, as in his judgment are best suited for the same and necessary to prevent the introduction of yellow fever into the United States, and, in his discretion, he may also establish at the group of islands known as the Dry Tortugas, at the western end of the Florida reef, and at such other point or points on or near the coast line of the United States (not to exceed four in the aggregate) as he deems necessary, quarantine grounds, stations, and anchorages, whereat or whereto infected vessels bound for any port in the United States may be detained or sent for the purpose of being disinfected, having their cargoes disinfected and discharged, if necessary, and their sick treated

in hospitals until all danger of infection or contagion from such vessels, their cargoes, passengers, or crews has been removed.

SEC. 2. That in cases in which the title to the land and water so selected and designated is in the United States it shall be the duty of the department, bureau, or official of the United States having custody or posesssion of such land and water, or any part thereof, not used by the Government for other purposes designated by law, or possession of said Dry Tortugas Islands, on demand of the Secretary of the Treasury, to deliver the same into his custody and possession for the use of the Public Health and Marine-Hospital Service, evidencing such delivery by a suitable instrument in writing to be delivered to the Secretary of the Treasury. That in cases in which the title to such land and water, or any part thereof, is in any other owner than the United States it shall be the duty of the Secretary of the Treasury to secure the title and possession of the same to the United States for the use of the Public Health and Marine-Hospital Service of the United States, by purchase at a reasonable price, if possible; but if, in his judgment, the price demanded for such property be excessive, he is hereby authorized to apply to the Attorney-General of the United States to cause to be instituted, in the proper tribunal, condemnation proceedings in the name of the United States for the purpose of acquiring for the United States the title and possession of such land and water, and said Attorney-General shall, as soon as possible after such application by the Secretary of the Treasury, cause such proceedings to be instituted and conducted to a conclusion, and the custody and possession of such land and water, when duly acquired in accordance with the award made in such condemnation proceedings, shall be delivered to the Secretary of the Treasury for the use of the Public Health and Marine-Hospital Service.

SEC. 3. That on acquiring possession of any land and water in accordance with the provisions of this act for the purpose of establishing thereat a quarantine station and anchorage, the Secretary of the Treasury shall cause to be published in such newspapers as he may think proper, once a week for four successive weeks, a notice of the selection and designation of such places for quarantine stations and anchorages, with a description of the boundaries of such quarantine stations and anchorages, and such rules and regulations as he shall adopt and promulgate, requiring vessels with yellow fever among their passengers or crews to go to specified quarantine stations and anchorages, to be dealt with there before visiting any port of the United States. He shall establish at such quarantine stations and anchorages all necessary instrumentalities for disinfecting vessels and their cargoes, and where the same shall be required shall erect the necessary hospital buildings and install the necessary furniture and fittings for receiving and treating the sick among the passengers and crews of vessels going to such quarantine stations and anchorages, and provide for the separation of those among their passengers and crews who are suffering from yellow fever from those who are in good health, and shall further provide for doing all things necessary to eradicate such disease from such vessels, their cargoes, passengers, and crews.

SEC. 4. That any vessel, or any officer of any vessel, or other person other than State health or quarantine officers, entering within the limits of any quarantine grounds and anchorages, or any quarantine station and anchorage, or departing therefrom, in disregard of the quarantine rules and regulations or without the permission of the officer in charge of such quarantine ground and anchorage, or of such quarantine station and anchorage, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than three hundred dollars or by imprisonment for not more than one year, or both, in the discretion of the court. That any master or owner of any vessel violating any provision of this act, or any provision of an act entitled "An act granting additional powers and imposing additional duties on the Marine-Hospital Service," approved February fifteenth, eighteen hundred and ninety-three, or violating any rule or regulation made in accordance with this act or said act of February fifteenth, eighteen hundred and ninety-three, relating to the inspection of vessels, or to the prevention of the introduction of contagious or infectious diseases into the United States, or any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of such vessel or its contents, or as to the health of any passenger or person thereon shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not more than five hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court.

SEC. 5. That in any place where a quarantine station and plant is already established by State or local authorities it shall be the duty of the Secretary of the Treasury, before selecting and designating a quarantine station and grounds and anchorage for vessels, to examine such established stations and plants, with a view of obtaining a transfer of the site and plants to the United States, and whenever the proper authorities shall be ready to transfer the same or surrender the use thereof to the United States, the Secretary of the Treasury is authorized to obtain title thereto or possession and use thereof, and to pay a reasonable compensation therefor, if, in his opinion, such purchase or use will be necessary to the United States for quarantine purposes, and the quarantine stations established by authority of this act shall, when so established, be used to prevent the introduction of all quarantinable diseases.

SEC. 6. That whenever any established station, or any land or water, or any part thereof, shall be acquired by the United States under the provisions of this act, jurisdiction over the same shall be ceded to the United States by any State in which the same is situated before any compensation therefor shall be paid.

SEC. 7. That the sum of five hundred thousand dollars, or so much thereof as may be necessary, is hereby appropriated, out of any money in the Treasury not otherwise appropriated, for the purpose of carrying into effect the provisions of this act, as well as for the purpose generally of preventing the importation of yellow fever and other quarantinable diseases into the United States, and for the further purposes, in cooperation with State or municipal health authorities, of eradicating them should they be imported, of preventing their spread from one State into another State, and of destroying their causes.

Approved, June 19, 1906.

SCIENTIFIC RESEARCH AND SANITATION.

The operations of the Bureau pertaining to scientific research and sanitation are conducted through the division bearing this name. Its purview includes the hygienic laboratory, the administrative needs thereof, as made known by the director, including the purchase and equipment of apparatus and supplies, and professional and nonprofessional personal service.

The relation established by the general regulations between the Bureau and the hygienic laboratory is deemed efficacious and to the best interests of this scientific institution and the Service of which it is a part.

The Bureau is frequently called upon for scientific investigations which involve far more than purely laboratory work, and to which it may assign most advantageously officers who are not at the time on duty in the laboratory, but whose investigations must be supplemented by the technical skill in one or other of the laboratory divisions.

Then again, laboratory investigations, pure and simple, frequently require the assistance of additional help which is given by the Bureau, either by detail of regular officers of the Service or by appointment under the civil-service rules.

A feature in the coordination of the laboratory with the general Service is the Bureau sanitary board. To this board are referred questions relating to sanitary science and hygiene that require careful consideration and written expressions of opinion for the assistance of the Surgeon-General in final determination. The board consists of the officers in charge of the Bureau divisions of quarantine and immigration, scientific research and sanitation, sanitary reports and statistics, and the director of the hygienic laboratory. Through the last named, the latest scientific technical knowledge becomes available in administrative considerations.

The work of the Bureau during the past year through the division of scientific research and sanitation, with supplemental work in the laboratory, has embraced the following, viz: Inspection and licensing of establishments engaged in the manufacture or propagation of vaccine virus, antitoxic serums, etc.; determination of relative strength of suprarenal preparations; measures for the prevention of tuberculosis in Government offices and workshops; the establishment of a national leprosy investigation station at Molokai, in the Hawaiian Islands; the Service participation in the work of the Porto Rico anæmia commission; investigations of the Rocky Mountain (spotted) fever, and the operations of the Yellow Fever Institute.

INSPECTION OF THE MANUFACTURE OF VACCINE, SERUMS, ETC.

The importance of this function—the enforcement of both purity and potency of vaccine and antitoxic serums—can hardly be overestimated. During the fiscal year 13 establishments were reinspected and relicensed. The law has operated efficiently to the end for which it was passed, and it is appropriate here to review the salient points in its administration.

Under its provisions and the regulations made to enforce it no establishment may engage in the manufacture or propagation of the products above mentioned for the purpose of interstate traffic until said establishment has been inspected by a qualified officer of the Public Health and Marine-Hospital Service, and a license granted by the Secretary of the Treasury. The report of this inspector is made upon carefully prepared blank forms, so that no necessary item of the examination shall be omitted. The inspection relates to proper facilities as to buildings, their cleanliness, the methods of preparation, storing, and all details of the manufacture and sale. The inspector also purchases in open market, or in the establishment itself, samples of the products, which are then sent to the director of the hygenic laboratory for examination as to purity and potency. The report of the inspector is referred to the sanitary board of the Bureau, the findings of which board are reviewed by the Surgeon-General and forwarded by him to the Secretary of the Treasury, with recommendation as to granting of license.

Samples of the products of these firms are purchased from time to time in the open market and examined in the hygienic laboratory for purity and potency. As a result of these examinations during the fiscal year the license of one firm was suspended, their products having been found to be contaminated. Upon the withdrawal of all their serum then on the market and regeneration of the laboratory technique and records the suspension was removed.

Another firm was refused a license, their products, upon examination, having been found to be contaminated and below the standard of potency fixed by the Public Health and Marine-Hospital Service.

With these exceptions the products offered on the market by the different manufacturers have been very stisfactory.

Following is a list of the firms or establishments at present having licenses for the products indicated. It should be remarked that a reexamination and relicensing is required each year, but the number of the license as at first given to each of the firms is retained

from year to year to prevent the necessity of an annual change of label. The numbers omitted from the following list are the numbers of licenses held by firms which have suspended operations or failed to apply for relicense.

No. of license.	Firm or person.	Products.
1	Parke, Davis & Co., Detroit, Mich	Vaccine virus, serums, and toxins.
2	H. K. Mulford Co., Philadelphia, Pa	Do.
3	Dr. H. M. Alexander & Co., Marietta, Pa	Vaccine virus and diphtheria antitoxin.
5	Fluid Vaccine Co., Milwaukee, Wis	Vaccine virus.
6	The Pocono Laboratories, Swiftwater, Pa	Do.
7	National Vaccine and Antitoxin Establishment, Washington, D. C.	Vaccine virus and diphtheria antitoxin.
8	Cutter Analytic Laboratory, San Francisco, Cal	Vaccine virus, diphtheria antitoxin, and antistreptococcus serum.
9	Frederick Stearns & Co., Detroit, Mich	Diphtheria antitoxin.
10	....do	Vaccine virus.
14	Health department of the city of New York	Diphtheria antitoxin.
15	W. R. Hubbert's Serum Laboratory, Detroit, Mich	Do.
16	National Antitoxin Establishment, Washington, D. C.	Do.
17	Lederle Antitoxic Laboratories, New York, N. Y	Do.
18	Burroughs, Wellcome & Co., London, England	Do.

IMPROVEMENT OF VACCINE FOLLOWING LAW OF JULY 1, 1902.

In the annual report for 1905, pages 217–218, reference is made to an inquiry by circular letter of the Bureau addressed to local health officers in each county of the United States, through the State health officers, relative to vaccination. The request was for " facts concerning the relative incidence of sore arms accompanying vaccination during the past winter (1904–5) as compared with previous seasons, especially three, four, and five years ago."

It was desired to ascertain whether practical results coincided with the laboratory data, which indicated great improvement in the purity of vaccine virus following the administration of the law approved July 1, 1902, regulating the manufacture, barter, and sale of viruses, serums, toxins, and analogous products.

Nine hundred and fifty-one replies were received to this inquiry, of which 237 gave no data bearing on the subject. Eight of the replies stated that there were more sore arms reported, one of these, however, attributing the complication to other causes than the character of the virus; 52 stated that they had not observed any difference in the number of sore arms during the year, while 554 reported that there had been fewer sore arms during the period of 1904–5.

The replies indicate that there has been a decided improvement in the character of vaccine virus following the passage of the law, and it would appear that the value of Government supervision of the propagation of this important product has been demonstrated.

Following is a summary of the replies received to the circular referred to:

Name of State.	Replies indicating—				Total.
	Fewer sore arms, i. e., purer virus.	Deterioration of purity.	No difference.	No data given.	
Alabama					0
Arkansas					0
California	20	1	1	4	26
Colorado	9	0	1	16	26
Connecticut	0	0	0	2	2
Delaware					0
District of Columbia	0	0	1	0	1
Florida	1	0	0	0	1
Georgia					0
Idaho	1	0	0	0	1
Illinois	41	0	2	11	54
Indiana					0
Iowa	11	0	1	8	20
Kansas	35	1	5	13	54
Kentucky	43	1	1	17	62
Louisiana	25	0	1	6	32
Maine	2	0	0	0	2
Maryland	15	0	2	1	18
Massachusetts	8	0	0	4	12
Michigan	17	0	4	14	35
Minnesota	19	0	4	29	52
Mississippi				1	1
Missouri	26	0	3	19	48
Montana	9	2	3	1	15
Nebraska	17	0	1	8	26
Nevada	4	0	0	2	6
New Hampshire	2	0	0	3	5
New Jersey	5	0	0	3	8
New York	4	0	1	1	6
North Carolina	24	0	1	7	32
North Dakota	7	0	4	12	23
Ohio	28	0	1	7	36
Oregon	2	0	0	13	15
Pennsylvania					0
Rhode Island	4	0	0	1	5
South Carolina	12	0	0	0	12
South Dakota					0
Tennessee	22	0	3	16	41
Texas	35	0	2	21	58
Utah	2	0	1	11	14
Vermont	2	0	0	8	10
Virginia					0
Washington	10	0	0	5	15
West Virginia	13	0	0	12	25
Wisconsin	11	0	1	7	19
Wyoming	6	0	0	1	7
Alaska	0	0	0	1	1
Arizona	2	0	0	3	5
Indian Territory					0
New Mexico					0
Oklahoma	7	0	1	2	10
Service officers	47	2	4	41	94
No postmark	6	1	3	6	16
Total	554	8	52	337	951

RELATIVE STRENGTH OF SUPRARENAL PREPARATIONS—STANDARDIZATION.

During the year a request was received from the Medical Department of the Army for examination of the relative strength of a number of suprarenal preparations placed on the market by several establishments. The request was complied with, experimental tests being made in the division of pharmacology of the laboratory. The necessity of making these tests for relative strength has emphasized the necessity of establishing a standard for these and other animal extracts or preparations. Investigations with this end in view are, therefore, now in progress. This work is in direct line with previous

work of the laboratory in preparing a standard for diphtheria antitoxin, which latter has been adopted as a legal standard in the eighth decennial revision of the United States Pharmacopœia.

PREVENTION OF TUBERCULOSIS IN GOVERNMENT OFFICES AND WORKSHOPS.

The National Association for the Study and Prevention of Tuberculosis, at its first meeting, held in Washington, May, 1905, passed a resolution commending the good results accomplished in the treatment of tuberculosis at the national sanatoria established by the Army, the Navy, and the Public Health and Marine-Hospital Service, and recommending to the President the desirability of an inquiry, through proper officers of the Government, as to the sanitary conditions existing in all Government offices and workshops where a large number of persons are employed. This resolution was forwarded to the President by Mr. Livingston Farrand, executive secretary of the association, and the matter was referred by the President to the Surgeon-General of the Public Health and Marine-Hospital Service for a report.

Following is the report:

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
November 25, 1905.

SIR: I have the honor to acknowledge receipt, through Secretary Loeb, of the communication of Mr. Livingston Farrand, executive secretary of the National Association for the Study and Prevention of Tuberculosis.

Mr. Farrand has transmitted with his letter to you a resolution unanimously adopted at the meeting of the National Association for the Study and Prevention of Tuberculosis, held in Washington, May 18, 1905. This resolution declares "that in the interest of preventive medicine and the cause of industrial hygiene this association respectfully recommends to the Chief Executive of the nation the desirability of instituting an inquiry through the proper officers of the Government as to the sanitary conditions existing in all Government offices and workshops where a large number of persons are employed, especially with a view of recommending, if necessary, measures for the prevention of tuberculosis therein.

Secretary Loeb informs me that you desire a report upon this matter.

From conversations and addresses which I heard at the meeting of this association it is evident that there is a sentiment among the members of the association that the United States Government should render aid to the general movement for the suppression of tuberculosis in so far as it is possible. The opinion was expressed that in a number of Department buildings in Washington, as well as in factories, workshops, etc., attached to the different branches of the Government throughout the country, insanitary conditions prevail which tend to increase the prevalence of tuberculosis, and by taking proper measures the Government could not only diminish tuberculosis among its employees, but would set an example which would be very powerful in its influence upon State and municipal authorities in enforcing preventive measures in their own institutions.

In a general way, the idea seems to have been that a careful investigation would show the insanitary conditions which prevail, and would be the means of suggesting measures to correct the same. These measures would naturally relate both to the interior of buildings and to requiring Government employees afflicted with tuberculosis to take such personal measures as might be required to prevent their conveying the disease to others while engaged in their governmental duties.

I am of opinion that the suggestion is a practical one, and, after consultation with the Acting Secretary of the Treasury, believe that the report as above made meets with the request contained in Secretary Loeb's letter.

Respectfully,

WALTER WYMAN, *Surgeon-General.*

The PRESIDENT.

(Inclosures. Mr. Farrand's letter and inclosure returned.)

A second communication was received from Secretary Loeb, with request to advise the President as to what steps should be taken by him to accomplish what was suggested in the resolution of the association. After conferring with the Surgeon-General of the Army and the Surgeon-General of the Navy the following reply was sent:

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
Washington, December 4, 1905.

SIR: I am in receipt of a letter from Secretary Loeb, dated November 27, 1905, returning my letter of the 25th of November, and inclosures, in response to his former letter with reference to the prevention of tuberculosis.

Secretary Loeb requests that I "advise the President what steps should be taken by him in order to accomplish what is suggested in the resolutions of the association."

In response to this request, I have the honor to recommend that a committee be appointed, consisting of the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Public Health and Marine-Hospital Service to prepare and submit to the President for approval a plan for carrying out the intent of the resolutions of the National Association for the Study and Prevention of Tuberculosis, and that this committee of three be empowered to detail one or more officers from each of the Services represented for the purpose of assisting in the formation of a plan for investigation and action.

Respectfully,

WALTER WYMAN,
Surgeon-General.

The PRESIDENT.

(Four inclosures returned, as requested.)

The President then issued the following Executive order, December 7, 1905:

EXECUTIVE ORDER.

The National Association for the Study and Prevention of Tuberculosis recently adopted the following resolution:

"*Resolved*, That in the interest of preventive medicine and the cause of industrial hygiene this association respectfully recommends to the Chief Executive of the nation the desirability of instituting an inquiry through the proper officers of the Government as to the sanitary conditions existing in all Government offices and workshops where a large number of persons are employed, especially with a view of recommending, if necessary, measures for the prevention of tuberculosis therein."

In view of this resolution and in the interest of the Government service, I hereby appoint Surg. Gen. Robert M. O'Reilly, U. S. Army, Surg. Gen. P. M. Rixey, U. S. Navy, and Surg. Gen. Walter Wyman, of the Public Health and Marine-Hospital Service, a committee to prepare and submit to the President for approval a plan for carrying out the intent of the above resolution, and the committee is hereby empowered to detail one or more persons from each of the Services named for the purpose of assisting in the formation of a plan for investigation and action.

THEODORE ROOSEVELT.

THE WHITE HOUSE.
December 7, 1905.

In accordance with the provisions of this Executive order, a board was appointed, consisting of one officer from each Service, as follows: P. A. Levering, medical inspector, U. S. Navy, chairman; Walter D. McCaw, surgeon, U. S. Army; M. J. Rosenau, director of the hygenic laboratory, Public Health and Marine-Hospital Service, recorder. Written instructions were issued to the board by the committee of the three Surgeon-Generals, narrating the scope of the investigation and the Executive action contemplated, and directing the board to carefully consider and report upon the measures deemed necessary and proper.

The report of the board, going into many necessary details and giving good reasons for certain limitations in the work to be undertaken, formed the basis of a formal report to the President. Thereupon the President issued a second Executive order February 28, 1906:

EXECUTIVE ORDER.

In accordance with the report and recommendations of the committee appointed by Executive order of December 7, 1905, to prepare a plan for the prevention of tuberculosis in the Government offices and workshops, I hereby promulgate the following order, with the object of eliminating and preventing tuberculosis among employees of the public service:

It shall be the duty of the head of each of the Executive Departments in Washington to cause to be printed and transmitted to all of the Federal buildings under his control the rules prepared by said committee to prevent the spread of tuberculosis in the buildings, and to require their display by the custodian in such manner and in such number as is necessary to carry out the intent of the rules.

It is hereby required of each Department to ascertain the names of any persons in the service in said Department afflicted with tuberculosis and to present to them the printed rules prescribed by said committee for their observance.

The nonobservance of said rules shall, in the discretion of the head of the Department, be considered a just cause for separation from the service.

Whenever there is doubt with regard to any person in the Government service as to whether said person is afflicted with pulmonary tuberculosis, an order shall be issued for said person to present himself (or herself) at one of the Government laboratories for examination and to present the Department from the director or other authorized officer of the said laboratory a certificate showing the result of said examination. If a Government laboratory is not accessible, the laboratory investigation shall be made at Government expense.

The Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Public Health and Marine-Hospital Service are hereby directed to cause a thorough sanitary inspection of the public buildings and workshops under their respective Departments; and they are authorized to detail from their respective medical services a sanitary board, or boards, for this purpose. The inspection of the public buildings and workshops other than those under the War and Navy Departments shall be conducted under the Surgeon-General of the Public Health and Marine-Hospital Service. The sanitary board, or boards, thus appointed shall report upon—

First. Insanitary conditions immediately remediable.

Second. Insanitary conditions requiring structural changes.

The said board when entering upon its duties in any Department shall report to the executive head of said building or workshop, who shall, on the request of the board, give such assistance as may be required.

The sanitary board, or boards, will make reports to the Surgeon-General of their respective services, who shall bring these reports before the committee appointed by Executive order of December 7, 1905, and said committee shall transmit a full report, with recommendations, to the President.

These duties to be additional to, and not taking precedence of, the regular duties of the members of the committee.

THEODORE ROOSEVELT.

THE WHITE HOUSE,
February 28, 1906.

In accordance with the foregoing order, the committee caused to be printed three forms covering the subject. Form 1 is a pamphlet, entitled "Prevention of Tuberculosis among Government Employees." It contains copies of the two Executive orders, information as to the nature of the disease, conditions favoring its spread, the danger of sputum, statements as to the curability of consumption, home advice for consumptives, copies of the regulations made to prevent the spread

of tuberculosis in the Government buildings, offices, and workshops, and the specific rules which must be observed by a Government employee afflicted with tuberculosis under penalty of separation from the service if not observed, as provided in the Executive order. Form 2 consists of a display card, headed "Regulations to prevent the spread of tuberculosis in Government buildings, offices, and workshops," and containing eleven rules for the sanitary care of the buildings and for personal observance by employees and others. Form 3 is a display card, on which is printed, "Do not spit on the floor; to do so may spread disease."

Forms 2 and 3, while separately printed, are also included in the pamphlet, Form 1.

Copies of these three forms were sent by the committee to each of the Executive Departments in Washington and to the Government Printing Office, with the information that such number of each of the forms as might be desired for distribution could be procured, on requisition, from the Public Printer.

It will be seen from the foregoing that it is contemplated that each head of an Executive Department shall obtain and distribute the forms prepared by the committee, and that enforcement of the prescribed measures is, by the terms of the Executive order itself, incumbent upon the Executive Departments.

The plan contemplates that each of the Departments shall find out, in a manner determined upon by itself, its employees afflicted at present with tuberculosis, and to present to each of said employees the pamphlet form No. 1. In case of doubt laboratory examination is provided for, and in the city of Washington a number of employees have been directed by the Departments to proceed to the hygienic laboratory for examination.

In accordance with the provisions in the Executive order, that the inspection of public buildings and workships other than those under the War and Navy Departments should be conducted under the Surgeon-General of the Public Health and Marine-Hospital Service, a board of officers of this Service was appointed, with the approval of the Secretary of the Treasury, May 2, 1906, to make said inspections in the District of Columbia. The board consisted of Surg. Frank W. Mead, Passed Asst. Surg. Rupert Blue, and Passed Asst. Surg. Baylis H. Earle. They have inspected 42 buildings in the District, and their reports are now undergoing examination and summarization for presentation to the President in accordance with the terms of the Executive order.

It was deemed advisable to make the beginning of this great work in the District of Columbia, but its scope embraces the public buildings throughout the United States. It is presumed that the three printed forms heretofore described have been sent from the Executive Departments to the public buildings, workshops, and offices. But the sanitary examination of these buildings, offices, and workshops is an undertaking that will require an indefinite period to accomplish. It is proposed to appoint boards of officers at different localities for the prosecution of this work, the order in which the examinations shall be held to be dependent upon either urgency or convenience.

Following are the forms referred to in the foregoing description of this sanitary and hygienic measure of the Government:

Form 1.

PREVENTION OF TUBERCULOSIS.

Tuberculosis is the most widely spread and deadly disease that affects humanity. It is infectious, and is communicated from the sick to the well.

The cause of the disease is a living germ, a minute plant called the *bacillus of tuberculosis*, which enters the body in various ways and there causes change of structure, destruction of tissue, and very often constitutional symptoms of a general bodily infection, with wasting away and ultimate death if not checked at the beginning.

I. NATURE OF THE DISEASE.

During the progress of the disease the germs are constantly multiplying in the affected parts of the body and may escape and infect others in several ways.

Germs entering through the skin may cause local tuberculosis without always a resulting general infection.

Germs swallowed may cause tuberculosis of the intestines and other internal organs.

Germs inhaled, thus gaining entrance to the air passages, cause by far the commonest of all forms of tuberculosis—*consumption, phthisis, pulmonary tuberculosis,* or *tuberculosis of the lungs.*

Consumption, the "great white plague" of mankind, causes in the United States and in Europe about one death in every four occurring between the ages of 20 and 50. No age, however, is exempt.

It is a disease that finds most of its victims at the active working age, and it carries off young boys and girls just entering upon the serious work of life, fathers and mothers of families, breadwinners, and citizens at the most useful periods of their lives.

Not only is consumption the most common form of tuberculosis, but it is the most infectious, the most dangerous to the public health.

The lungs and air passages affected undergo a destructive process, with the production of myriads of new living germs. By the constant coughing, hawking, and spitting attending consumption the germs are scattered far and wide. Rooms, houses, public vehicles, and even whole inhabited districts may become so contaminated with the germs that every healthy person breathing the air of such places is subjected to constant danger of acquiring the disease.

The germs outside of the body are very long-lived and resistant to destruction.

II. DANGER OF SPUTUM.

The disgusting habit of spitting upon the sidewalk, floors of public buildings, hallways, porches, the floors of carriages, cars, boats, etc., when the offender is consumptive, distributes day by day millions of disease germs in all directions.

The sputum soon dries, the germs mix with the air and dust of the buildings or vehicles, and are inhaled into the lungs of healthy persons.

The fresh living germs in moist sputum are especially virulent, and the greatest care must be exercised not to permit such germs to enter the mouth. Myriads of the germs adhere, for instance, to the drinking glass, and may be transferred from the sick to the well by drinking from a glass or cup which has recently been used by a consumptive. In a similar manner the germ of the disease may be conveyed by towels, handkerchiefs, soap, and other toilet articles, tableware, and objects of personal use.

If it were not for the power that very vigorous people, living healthy lives, possess to resist disease in general, it is probable that consumption would kill off whole communities, because it hardly seems possible that any single inhabitant of a city, where many have consumption, can for long escape breathing into his lungs some of the germs of the disease.

III. Conditions Favoring Spread of Tuberculosis.

People most liable to infection are those who live unhygienic lives, or who are compelled, in order to get a livelihood, to work amid unhealthy surroundings.

Overcrowded, unventilated dwellings, offices, and workshops, sedentary occupation with lack of exercise, trades causing much dust which by irritating the lungs produce favorable conditions for the growth of the germ, poor food and insufficient clothing, uncleanliness of person and surroundings are all factors in predisposing persons to consumption; but it must be remembered that nothing can actually *cause* consumption except the entrance of the germ into the body.

It is commonly said that certain families inherit tuberculosis, and it is beyond doubt that a certain constitution predisposed to consumption may be inherited, but the real reason that generation after generation in some families has died of the disease is generally that the sick members of the family have infected the well.

No matter where the germs are accidentally lodged—whether on floors, sidewalks, vehicles, on clothing or utensils—their vitality is fostered by dirt, dampness, and darkness. On the other hand, sunshine, pure air, and cleanliness are most valuable means of resisting and destroying the infection and of curtailing the disease when early recognized.

But the *only sure way of preventing infection is to destroy all the sputum of every consumptive*, for it is almost always by means of the sputum that a consumptive infects another person.

IV. Consumption is Curable.

It is now recognized that consumption is undoubtedly curable when intelligent treatment is undertaken early in the disease. Certain climates are known to be very favorable to a cure, and annually hundreds of people seek to recover their health by going to Colorado, southern California, or elsewhere.

The only reason that climate cures the disease is that sunshine, equable temperature, and absolutely pure air can be better taken advantage of in some places than in others.

It is possible for recovery to take place in almost any climate if plenty of pure air can be obtained and the body protected against dampness and sudden variations in the weather, and no consumptive whose case is recognized early should despair because his poverty and the necessity of providing for his family will not permit treatment in some of the recognized favorable climates.

It is of course advisable that every consumptive should, when possible, live in a favorable climate or be treated in a sanitarium where not only the best prospects of cure are to be had, but where the danger to the health of others is eliminated.

It is to be hoped that before long all communities will understand that, to provide for the indigent consumptives in their midst, sanitarium treatment at the public expense is not only a humane measure of the first order, but an economical self-protective measure in which every citizen has a vital interest.

To stamp out tuberculosis it is necessary for everyone to participate in the recognized sanitary rules for preventing this deadly disease.

Already the work of health officials throughout the country in disseminating plainly written pamphlets on the subject and formulating rules of hygiene in the simplest language has been successful in saving lives.

In order that persons in Government employ may be as far as possible protected during the hours of work in public buildings, certain general rules should be observed by all employees, and special precautions are necessary when any person working with others is found to have consumption.

As good health is required in appointment to the classified civil service, as those in the service are intelligent people, and the conditions under which they work are generally not unhygienic, it is not likely that much tuberculosis will be found among them. Some cases are inevitable, however; perhaps unrecognized as such by the patients and their friends; perhaps known to the sufferers, who are compelled to continue their daily work in order to maintain their families, and who even conceal the nature of their complaint for fear of losing their positions.

The rules of prevention are quite simple, and in the light of the foregoing remarks can be understood by anyone with ordinary intelligence.

It is only in the exact and universal observance of the rules by the public generally and by patients in particular that success is to be hoped for in the great work of preventing the spread of the disease.

It is of vital importance to a community that all cases of pulmonary tuberculosis should be recognized as early as possible. It is also to the best interest of the patients that this be done.

The diagnosis can generally be made before the patient has progressed very far in the disease and before he has become a very great danger to others by a careful medical examination and by a laboratory test of the sputum to determine the presence of the bacilli.

If early treatment is instituted, the disease is curable in almost any climate.

The mere presence of a consumptive able to perform work does not constitute a grave danger to others if his sputum is destroyed before it can spread infection.

HOME ADVICE FOR CONSUMPTIVES.

1. Sleep alone.
2. Use no hangings, upholstered furniture, or useless floor coverings in your sleeping room.
3. Whitewashed or painted walls are preferable to those covered with wall paper.
4. Expose the bedroom freely to the outside air when not occupied, and sleep with the windows open. Spend as much time as possible in the open air, and use the bedroom only at night.
5. Do not be afraid of cold weather as long as the body is protected, and be especially careful to keep the feet dry.
6. Keep the body warmly clad and guard against sudden changes in the weather.
7. Take plenty of nourishing food. Consumptives often need more nutriment than they are inclined to take. Milk, eggs, and fatty foods are especially valuable when they can be assimilated.
8. There is no known medicine that can cure consumption. Medicines for the relief of cough and other symptoms of the disease should be taken only on the advice of a physician.
9. Lead a temperate life in all things.
10. Be scrupulously careful not to infect the other members of your family by distributing the germs contained in your sputum. Refrain from coughing as far as you can, but when it is necessary turn your head aside and hold a handkerchief over your mouth.
11. Use a destructible portable spit receiver, which can be bought for a few cents; use one or even more a day and destroy them by burning.
12. Never swallow the material brought up from the lungs; it may cause infection of the digestive tract.
13. It is not best to use handkerchiefs to receive the sputum. Japanese paper napkins or squares of old linen, to be burnt when soiled, may be used; but these are not as cleanly as the portable spittoons.
14. Scrupulously avoid dust, disorder, dampness, darkness, and bad air in your home.
15. Be hopeful and expect a cure.

REGULATIONS TO PREVENT THE SPREAD OF TUBERCULOSIS IN GOVERNMENT BUILDINGS, OFFICES, AND WORKSHOPS.

1. All persons in Government employ are positively forbidden to spit upon the floors.
2. Rooms, hallways, corridors, and lavatories shall be freely aired and effectually clained at least once a day and not during working hours.
3. Spittoons shall receive a daily cleansing with very hot water, and when placed ready for use must contain a small quantity of water.
4. Dust must be removed as completely as possible by means of dampened cloths or mops. It should never be needlessly stirred up by a broom or duster, as this practice only spreads the dust and germs.
5. Floors of tiling, brick, or stone must be frequently scoured with soap and water.
6. The senior clerks in charge of workrooms will take measures to secure during working hours the admission of as much fresh air and sunshine as the conditions will permit.

7. The use of individual drinking glasses is recommended.
8. Persons in Government employ who suffer from pulmonary tuberculosis shall be separated when possible from others while at work.
9. Such persons will not be permitted to use the public spittoons, but must provide themselves with individual sputum receivers, preferably of easily destructible material, and carry these with them on arrival and departure. They will be held strictly responsible for the disposal and destruction of their own sputum, so that no other person's health may be endangered therefrom.
10. Such persons must provide their own drinking glasses, soap, and towels, and shall not use those provided for the general use.
11. Plainly printed notices, reading as follows, "Do not spit on the floor; to do so may spread disease," shall be prominently posted in rooms, hallways, corridors, and lavatories of public buildings.

V. PENALTY FOR NONOBSERVANCE OF RULES.

Paragraphs 1, 9, and 10 of the above regulations must be complied with by Government employees under the penalty prescribed in the Executive order of February 28, 1906.

Form 2.

This form consisted of the foregoing regulations to prevent the spread of tuberculosis in Government buildings, offices, and workshops.

Form 3.

The antispitting notice, mentioned above in regulation No. 11, constituted this form, which is intended for display in prominent places in public buildings.

THE NATIONAL LEPROSY INVESTIGATION STATION, AT MOLOKAI, HAWAIIAN ISLANDS.

The annual report of 1905, pages 195 to 205, contains a summary of the causes leading to the passage of an act of Congress, approved March 3, 1905, authorizing the investigation of leprosy, with special reference to the care and treatment of lepers in Hawaii, a copy of the act itself, and an account of my personal visit in the early part of June, 1905, to the island of Molokai, and the selection of a site as authorized by Congress. Following this visit, the governor of the Territory, by proclamation dated June 28, 1905, duly ceded to the United States the land selected, as required by the terms of the act. His proclamation included a description by metes and bounds.

The physical conditions surrounding this project of establishing a station for the investigation of leprosy are favorable. The work will be undertaken in a community where familiarity with the disease for generations has developed a sane public sentiment which, without hysterical manifestations, yields a constant moral support to better the conditions of the lepers. The station will be situated in a place where one of the largest aggregations of sufferers from the disease is gathered under conditions as near as possible to normal community life. The site chosen fulfills all the basic requirements of an ideal establishment for the purpose at hand. With a healthful and cool location, beautiful surroundings, an ample water supply, and convenient landing place, it leaves little to be desired from a physical viewpoint. The station will be situated on the outskirts of the smaller of two settlements which form the leper colony, and near enough for the professional purposes of the institution. The direction of the prevailing wind and the character of the land permit of an arrange-

ment of the buildings which will be convenient and to the windward of the leper settlement.

Plans and specifications for the construction of the necessary buildings have been prepared and advertised by the supervising architect, and it is expected that contracts will soon be made and the work of actual construction be begun in a very short time. Some delay in this matter has been caused by the necessity of awaiting recommendations from agents of the Government and others resident in Hawaii, regarding the character of the buildings and the materials of which they should be built. Knowledge of special conditions rendered their suggestions worthy of consideration. Some delay was also caused by an attempt to provide first by contract for the erection of a landing stage and construction of a shore road prior to the work on the buildings themselves, it being thought that more favorable contracts could be made for the buildings if a good landing place and roadway were previously provided. No bids were received, however, and therefore in the specifications now in the hands of bidders the entire work is provided for.

The newly appointed director of the station gives acknowledgments, in his reports, to Governor Carter and Acting Governor Atkinson for their interest and support; to the president of the Territorial board of health, and the other members of the board for their cooperation; and to the superintendent of the Hawaiian leper settlement and others for valuable suggestions.

After a careful survey of the field for the selection of an appropriate person to have charge of this important station, Dr. Walter R. Brinckerhoff, instructor of pathology at Harvard University, was, with the approval of the Secretary of the Treasury, appointed March 2, 1906, Director.

Upon appointment Doctor Brinckerhoff was given instructions relative to the projected investigation, particularly with reference to the scientific policy to be pursued in the conduct of the station. While he was in Washington conferences were held with the director of the hygienic laboratory, in which the technical aspects of the problem, and in particular the proposed laboratory work of the station, were considered in detail. A number of conferences were also held with the Supervising Architect with reference to the tenative plans.

En route from Washington, D. C., to Honolulu Doctor Brinckerhoff, under Bureau orders, visited the leper colony at Iberville Parish, La., to observe the methods of care and treatment of lepers in that institution. Upon his arrival at Molokai, Hawaii, he inspected the station site, and, as above stated, collected and forwarded necessary data.

He has already undertaken a preliminary investigation of leprosy by visits to the island of Molokai, observations of methods adopted by the Territorial authorities, and by the establishment of a temporary laboratory at the United States quarantine station at Honolulu. The permanent equipment of the laboratory on the island of Molokai is in course of preparation.

NECESSITY OF A HOME FOR LEPERS IN THE UNITED STATES.

While on the subject of leprosy it is pertinent here to narrate certain events during the past year which emphasize the necessity of a home for lepers under Government control. It will be recalled that a bill for the establishment of such a home was introduced in the Fifty-eighth Congress. This bill was passed by the Senate, was reported on favorably by the House Committee on Interstate and Foreign Commerce, but on the last day of the session failed to pass the House.

In June, 1906, there arrived at Elkins, W. Va., where two of his brothers lived, Maroun Raschid, a native of Syria. He had landed at New York from Beirut in 1902, at the age of 17. Two years after landing in America he developed symptoms of leprosy. For some time he worked in a cotton factory in Maine, until he was physically unable to work longer.

Three weeks after his arrival at Elkins, W. Va., the city health officer recognized the case as one of undoubted leprosy. The said health officer reported the case to the secretary of the State board of health, who in turn reported it to the Bureau by telegraph and requested advice as to his disposition. Reply was sent that the patient did not come within the provisions of the immigration law relating to deportation, the time limit within which he could be deported having expired; that there was no national leper home to which he could be sent, and that there was no appropriation under which he could be cared for by the Service.

The patient desired to return to Syria, and undertook to reach New York by the Baltimore and Ohio Railroad, but according to press accounts was turned back at Philadelphia and was switched off in a freight car onto a siding at Golden Oak, Md. He was cared for by the Maryland authorities at this point for a while, and then returned by them to West Virginia, arriving at Parkersburg July 31. By the West Virginia authorities he was sent to Pickens, in that State, and isolated near that town under care of the State board of health, a physician being appointed to care for him.

The Bureau was appealed to from several sources to do something for this leper, and in each instance a reply was sent that officially the Bureau had no power nor responsibility in the matter. However, the matter was taken up privately between the Surgeon-General, the secretary of the State board of health of Maryland, and the quarantine officer of the port of New York. A movement had been started among the Syrians and others benevolently inclined for the collection of a fund sufficient to secure transportation back to the land of his nativity, to which he was eager to go, believing there he would find a cure for his disease.

Through the efforts of the secretary of the State board of health of Maryland and others a sufficient fund was raised, and on being informed to this effect I communicated with the quarantine officer at New York, who endeavored to arrange for the transportation of the leper with an attendant on some steamer bound for Alexandria, Egypt, from which city the leper could doubtless find his way to Beirut. Before the necessary arrangements could be completed, however, death ended the sufferings of this unfortunate person October 20.

The newspapers were full of the hardships encountered by this leper in being bandied from place to place, isolated, and an object of aversion wherever he went, the spectacle being one discreditable to the country. The incident emphasized the necessity of a national leper home. Other strong arguments are detailed in the last annual report (1905), which also contains a copy of the bill presented in the last Congress and which failed of passage.

The arguments will not be repeated here, but I recommend that the bill be reintroduced at the coming session of Congress, and trust that it will receive favorable action.

PORTO RICO ANÆMIA COMMISSION.

The excellent results accomplished by this commission during 1904 induced the Porto Rican legislature to appropriate the sum of $15,000 to initiate the work of combating uncinariasis (hookworm disease) in Porto Rico.

At the request of the governor of Porto Rico, Passed Assistant Surgeon King was allowed to continue his services as a member of that commission.

The commission established a central station at Aibonito, in the mountainous interior, where the disease was most prevalent. The out-patient clinic was opened June 1, 1905, and a tent hospital of 60 beds was ready for occupancy June 15. In this hospital were placed only very ill patients and those on whom special studies were made. From June 15 to November 30, 1905, 207 patients received 7,137 days of hospital treatment.

The attendance at the outdoor clinic assumed large proportions from the start, on several occasions exceeding 500 patients in one day. The diagnosis was always made by microscopical examination of the patient's feces. A record of the case was made, medicine for a week or two furnished the patients, and instructions given to return at the end of that time. Such was the benefit they experienced that they returned regularly, although some of them had to walk many miles.

By November 30, 1905, the date of the report of the commission, 6,152 patients had visited the central stations 24,628 times.

As soon as the work at this station became well organized the commission began to establish substations in various parts of the island under the charge of local physicians. Nine stations, established at Barranquitas, Barros, Coamo, Comerio, Guayama, Lares, San Sebastian, Moca, and Utuado, treated 12,713 patients.

The death rate was marvelously low, only about one-third per cent, and most of the deaths were due to complications or intercurrent diseases.

In addition to being cured, the patient was given some instruction as to the means of prevention. A few plain explanations were given as to the cause of the disease, how it was contracted, and how to prevent reinfection. Specimens of the parasite were shown, and a small pamphlet containing these explanations in simple language was given to those who could read or had anyone to read to them. Special stress was laid upon the use of latrines as a preventive measure. Practically none of the country houses of the lower classes had latrines, and the pernicious habit of defecating at any convenient bush had been so long the custom that the commission approached

with hesitancy any attempt to get the people to build and use latrines. The effort was so successful that about 90 per cent of the houses in the district covered by the commission now have their latrines.

The results of the treatment was all that could be expected. About 84 per cent were cured, while at the time of the report a larger number were improved, but still under treatment.

The relative value of beta-naphthol and thymol was carefully studied. Both were found to be excellent, though generally preference was given to thymol as being less irritating and somewhat quicker. On the average five doses of either are sufficient for a practical cure.

It was demonstrated that about 75 per cent of all uncinariæ were expelled by the first dose of anthelmintic. This fact is of immense importance in prophylaxis, as the patient is that much less a source of infection. Thus it can be readily understood that the treatment of the "worm carriers," with or without symptoms, is the most practical, cheapest, and most successful prophylaxis.

The commission found that iron possesses small value, relatively, in the cure of this disease, occupying much the same relation as in the treatment of malaria or syphilis. Its use was almost abandoned, as the results would scarcely justify the expense.

The commission concurs in the theory of Looss, that the infection generally takes place through the skin, and considers other routes as of rare occurrence.

Special studies of the pathology, treatment, prophylaxis, and other points of scientific interest were made and will be published in a later report of the commission.

The commission consisted of Dr. Pedro Gutierrez, Passed Asst. Surg. W. W. King, United States Public Health and Marine-Hospital Service, and Capt. Bailey K. Ashford, assistant surgeon, U. S. Army.

They submitted their preliminary report to Mr. Beekman Winthrop, governor of Porto Rico, January 1, 1906, and it was published in English and Spanish by the Territorial government.

In their present report the commission discusses the necessities of this work and the conditions in Porto Rico which favor or embarrass it. A plan is given for its continuance during the present year at a cost of $80,000,

The Porto Rican legislature appropriated $50,000 for this purpose, and the work is now being carried on by a commission composed of Porto Rican physicians.

The work which has been done with uncinariasis in Porto Rico has been a remarkable achievement of American medicine and American physicians. Its sanitary and economic importance is not yet fully appreciated even by the medical profession. It has been likened to the work of the yellow fever commission in Cuba.

ROCKY MOUNTAIN (SPOTTED) FEVER.

This disease, which occurs each spring in certain parts of the Rocky Mountain region, made its appearance in the Bitter Root Valley of Montana early in the spring of 1906. It has attracted much attention because of its high mortality, and has been the subject of investigation during the past four years.

Surg. J. O. Cobb visited the Bitter Root Valley, Montana, in June, 1902. His report, which appeared in the weekly Public Health Reports, August 15, 1902, contains a brief account of the disease as it prevailed that season.

During the season of 1903, at the request of the Montana State board of health, Passed Asst. Surg. John F. Anderson investigated the disease on behalf of the Service. He introduced into medical literature the name "Tick fever" for this disease, accepting the tick as "the very probable and almost proved method of transmission."

The report of his observations was published as Bulletin 14, Hygienic Laboratory.

Dr. Ch. Wardell Stiles, of the Public Health and Marine-Hospital Service, made a zoological investigation into the cause, transmission, and source of the disease during the season of 1904, a preliminary report of which was published in the annual report for 1904. A complete report of his investigations was subsequently published as "Hygienic Laboratory Bulletin No. 20."

The results were for the most part negative findings, but he gave a complete historical review of the disease and collected the literature relating thereto.

Passed Asst. Surg. Edward Francis was detailed to investigate the disease in 1905 and spent the months of May and June in Montana. The lack of definite knowledge as to its cause and mode of transmission called for further investigation, with the view of adopting measures for its suppression.

At the request of the Hon. J. M. Dixon, Member of Congress from Montana, and the board of health of that State, Passed Asst. Surg. W. W. King was detailed April 19, 1906, with the approval of the Secretary of the Treasury, to make a further study of the disease. He arrived at Missoula on April 23 and remained in the valley until June 30.

As the season was well advanced and the necessity of the case urgent, Doctor King could not prepare and take with him a complete laboratory equipment, but the excellent laboratory of the Northern Pacific Hospital was placed at his disposal, and he is indebted to Dr. H. T. Ricketts, of Chicago, for his courtesy in extending the use of laboratory supplies.

Dr. William M. Chowning and Dr. H. T. Ricketts were already in Missoula working on the problem of spotted fever. Although using the same laboratory, all these physicians worked independently.

Four cases, all fatal, had occurred prior to the arrival of Doctor King. Afterwards nine more cases occurred, of which seven died.

Considerable time was spent in the examination of blood and the making of cultures, but without success in finding anything that would throw light upon the causation of the disease.

In previous years inoculations of blood into dogs, sheep, rabbits, and other animals had proved unsuccessful. However, this year both Doctor Ricketts and Doctor King were successful in inoculating monkeys and guinea pigs, and on his return to the hygienic laboratory on July 1 Doctor King brought several of the latter sick with the disease.

Experiments to determine the cause and methods of transmission are being carried on at the laboratory, and a fuller report will be

published when they are completed. It will not be amiss, however, to quote the preliminary report of Doctor King, showing that he was successful in transmitting the typical disease from one guinea pig to another by means of the tick. Doctor King states in part as follows (see Public Health Reports of July 27, 1906):

The belief that spotted fever was caused by a piroplasma, a genus of organisms carried by ticks, and the coincidence of the season of prevalence of the fever with that in which the ticks are found suggested to Wilson and Chowning the possibility that the tick was the agent concerned in the transmission of the disease. The theory was extremely difficult of either proof or disproof, the fatality being too great to justify experimentation with human subjects, and until the present season none of the lower animals were shown to be susceptible to the infection.

During the spring of 1906 guinea pigs and monkeys were proved to be susceptible to spotted fever by direct inoculation with blood from patients. The typical fatal disease was repeatedly produced by Ricketts and myself, and I am still continuing the disease from one animal to another.

To prove or disprove tick infection now seemed possible, and with this idea in view I placed one male and three female ticks (*Dermacentor occidentalis*) on a guinea pig suffering with spotted fever. They remained until removed after the death of the animal two and one-half days later. The female ticks were but slightly enlarged. These ticks were taken to the hygienic laboratory, Washington, D. C., the male dying in transit.

Nine days after removal from the guinea pig the remaining female ticks were placed upon a healthy guinea pig. One was killed by the guinea pig. The others remained until they dropped off after five days. Three days later the guinea pig began to show symptoms. It developed the same clinical picture as those animals inoculated directly with infectious blood. There was fever, emaciation, enlargement of the scrotum, very marked hemorrhagic eruption on skin of scrotum, ears, feet, and back. At death two hemorrhagic spots on the scrotum were becoming gangrenous. The tick-infected pig had been kept in a separate cage and at no time was in any contact with other animals having spotted fever. A guinea pig was inoculated with the heart's blood from the tick-infected pig. It has sickened, and apparently will develop the disease.

Whether the transference was mechanical or whether the infecting organism must undergo a cycle of development remains to be determined, and will be the subject of further experiments. However, it seems conclusive that the tick is capable, under certain circumstances, of conveying the infection from guinea pig to guinea pig, whether the transmission be mechanical or biological. This fact is the first positive experimental evidence in favor of the tick theory and reopens the question of the method of infection in man. At least it deserves the serious consideration of people living within infected territory.

Because of its high mortality and economic importance to the people of the Rocky Mountain region, it is believed that the problems of this interesting and dangerous disease should receive further careful study. It is proposed, with the approval of the Secretary of the Treasury, to continue the investigations with the hope of definitely proving the correctness of the tick theory of transmission and finding means of prevention.

THE YELLOW FEVER INSTITUTE.

The operations of the Yellow Fever Institute of the Public Health and Marine-Hospital Service are conducted in the division of scientific research and sanitation.

It will be recalled that this institute was established with the approval of the Department in 1901, for the purpose of continuous investigation of yellow fever, and to coordinate so far as possible the efforts of all investigators by making the membership of the institute include workers in this field, whether attached to any Government

service, national, State, or municipal, or whether engaged in private practice or research.

Fifteen bulletins have been issued by the institute, including one during the present year.

The recent severe epidemic of yellow fever in New Orleans afforded an opportunity of continuing investigations into the cause and transmission of yellow fever. Passed Asst. Surg. M. J. Rosenau, director of the hygienic laboratory, was accordingly detailed to this duty September 11, 1905. He proceeded to New Orleans, and, in conjunction with the officers of the Service engaged in epidemic work in that city, made valuable investigations into the alleged hereditary transmission of the disease in mosquitoes.

The work was done in an improvised laboratory in the yellow-fever hospital from September 13 to October 18, when, owing to the subsidence of the epidemic and the difficulty of obtaining material, the work was transferred to the laboratory in Washington. In this investigation attention was especially directed to two problems—the cause of the disease and the hereditary transmission of the virus of yellow fever in the mosquito. Attempts to grow the yellow-fever parasite in blood-agar tubes gave negative results. Mosquitoes, the progeny of mothers which had fed upon typical cases of yellow fever in the early stages of the disease, were permitted to bite nonimmunes, also with negative results.

A report upon this work has been published as Bulletin No. 15 of the Yellow Fever Institute. In view of the negative results recorded in this bulletin in the efforts to confirm the positive work of Marchoux and Simond, additional work will be necessary to settle the question of the hereditary transmission of the parasite of yellow fever in the *Stegomyia fasciata*.

The differential diagnosis of yellow fever is also a subject for further earnest study, particularly in relation to malaria, dengue, and typhoid fever.

INVESTIGATION INTO THE CAUSE OF THE PREVALENCE OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

Because of the increased prevalence of typhoid fever in the city of Washington, the Commissioners of the District on June 21, 1906, requested the Service to cooperate in making a comprehensive investigation of the origin and prevalence of the disease, including a bacteriological examination of the waters from each of the public pumps, which are a possible source of danger. The number of reported cases of typhoid fever in the city of Washington has increased instead of diminished within the year, notwithstanding the opening of the new filtration plant and the official tests showing that it is in successful operation. The health department of the District reported that the cases appear in uniform numbers throughout the community and seem to have no particular foci.

A board of officers, composed of Passed Asst. Surg. M. J. Rosenau, director of the hygienic laboratory; Passed Asst. Surg. L. L. Lumsden, and Dr. Joseph H. Kastle, chief of the division of chemistry, was appointed June 27, 1906, with the approval of the Secretary of the Treasury, to make a careful study of this important and at present mysterious matter. Four commissioned officers have been detailed

to the laboratory to assist in the investigation, which includes a bacteriological examination of the potable waters in the District of Columbia, a chemical examination of the waters used for drinking purposes, both from the public pumps and the Potomac River, and a careful sanitary inspection of the District from the epidemological standpoint.

Every reported case is being carefully investigated with special reference to the onset of the disease, the character of the water used, the sanitary condition of the residence, the presence of flies and other insects, the origin of milk, ice, and foods used, and the possibility of direct contagion.

Widal tests, blood cultures, and Diazo reactions will be made in all cases where it is possible. Zoological investigations will also be made to determine the presence of animal parasites in the excreta of typhoid cases, and the fauna of the river and well waters of the District will be studied. The work is now actively progressing, the results to be made known in a special report.

HYGIENIC LABORATORY.

The report of the director of the hygienic laboratory, Passed Asst. Surg. M. J. Rosenau, includes reports from the several chiefs of the divisions, which are summarized as follows:

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

Vaccine virus.—The examinations of vaccine virus, made under the authority of the act approved July 1, 1902, have been continued in the laboratory. This work always excites a great deal of interest and favorable comment from visitors, especially those associated with state boards of health, and others engaged in public health work. The various contaminating organisms found in vaccine virus are being gradually collected, and up to the present time there are about 50 organisms isolated in this laboratory from the vaccine virus. It is intended, as soon as time and assistance permit, to make a thorough study of these contaminating bacteria and to issue the results of this study in a laboratory bulletin. The laboratory has, on several occasions, demonstrated its methods in the examination of vaccine virus for purity to those engaged in the production of this article.

Examination of antidiphtheric serum from licensed manufacturers.—A large number of samples of antidiphtheric serum from the licensed manufacturers and those applying for licenses have been examined during the year. The product of one licensed manufacturer was found to be contaminated and below strength. A report of this was made to the Bureau and the license of the manufacturer was suspended until the faults which had been found by the inspector were corrected.

A sample of antitoxin from a foreign manufacturer applying for license was found below strength and report made to the Surgeon-General, by whom appropriate action was taken. A sample of antitoxin submitted by an applicant in the United States desiring to be licensed was examined in the laboratory and found to be contaminated; a report of this was made to the Surgeon-General.

The standard unit for diphtheria antitoxin was distributed at the usual bimonthly periods to those engaged in the manufacture of diphtheria antitoxin in this country, as well as to several foreign producers.

Examination of other therapeutic sera.—The laboratory has examined a number of other sera used for therapeutic purposes for licensed manufacturers and those desiring to be licensed. As there is no universally accepted standard for these products, they were not tested for potency, all the tests being for purity alone. Serums from two foreign manufacturers were found to be contaminated and report was made to the Surgeon-General for action.

Examination of specimens for diagnosis.—During the year a number of specimens (124) were received for diagnosis, but it is to be regretted that the Service officers do not avail themselves more of the facilities of the laboratory for this purpose. The laboratory is always glad to receive specimens for diagnosis, as in this way at times many interesting cases are encountered.

A large number of very valuable specimens were presented to the laboratory by Dr. Joseph McFarland, of Philadelphia, and Prof. R. M. Pearce, of Albany, N. Y. There is gradually accumulating a valuable and varied collection of pathological specimens which are of great benefit to student officers in their studies on pathology.

Antiseptics and disinfectants.—During the year a few samples of disinfectants were received for examination and reports were made upon them. The work of Passed Asst. Surg. T. B. McClintic upon the germicidal action of formaldehyde gas evolved was completed and the manuscript submitted for publication. His work shows that the quantity of formaldehyde liberated is not of so great importance as the question of humidity and temperature.

This is believed to be the most thorough study of the action of formaldehyde that has been made, and the bulletin will be of great benefit to those engaged in public health work.

Passed Asst. Surg. H. A. Stansfield made a study of the antiseptic and germicidal properties of chloroform, both in liquid and gaseous form. The results are now being edited for publication.

Examination of samples of water.—During the year a number of samples of water were received from various places for examination to determine the presence of *bacterium coli*, and reports were made of the results obtained.

Laboratory diagnosis of a case of plague.—The assistant director was instructed by the Surgeon-General to proceed to Reedy Island to determine whether a case of illness was plague. Material was obtained and brought to the laboratory for further study. The clinical diagnosis was confirmed by the examination. A point of special interest in this case was the very low virulence of the organism isolated, it requiring about twelve days for the guinea pig inoculated with the organism to die, the usual period being less than a week. Work of this character is of great aid in the diagnosis of cases of suspected plague and cholera arriving at our near-by quarantines.

Examination of tuberculous sputum.—A number of specimens of sputum from Government employees were examined in accordance with Executive order of February 28, 1906, and report made to the proper executive officers.

DIVISION OF PHARMACOLOGY.

Examination of drugs.—A considerable number of drugs received from the purveying depot were examined for purity and potency; this work included a number of alkaloidal assays and several physiological tests.

A number of suprarenalin preparations were also tested for comparative physiological activity for the Army. In this work it was found that some preparations had but one-fifth of the strength of others, although labeled the same. The results of these experiments will be published shortly.

Research work.—Research work has been conducted on a number of lines. Among these may be mentioned experiments on the physiological importance of iodine in the thyroid gland; the effect of thyroid feeding upon poisoning by acetonitrile, in which it was shown that the thyroid neutralizes this poison—the first time that this gland has been shown definitely to have an antitoxic action; the effect of alcohol and various foods upon susceptibility to certain poisons. An extensive series of experiments have been performed with Mr. Taveau (assistant in pharmacology) on the physiological action of choline and its compounds. A large number of such compounds have been discovered; some of them are extraordinarily active physiologically.

Much time was devoted to devising a method for the quantitative determination of formaldehyde gas in the air of a room. A large number of such determinations were made after the use of various forms of apparatus for liberating formaldehyde from its solutions. The results of this work are incorporated in Bulletin 27.

Work in connection with the American Medical Association.—The chief of the division was made a member of the council on chemistry and pharmacy of the American Medical Association in March, 1906. This council was formed to investigate the new drugs which are offered to the medical profession in such profusion, and to select the unobjectionable ones for publication in a book to be entitled "New and Nonofficial Remedies." The salutary effects of this examination of new drugs are already evident.

Bulletin 23 was prepared for the purpose of calling the attention of the medical officers of this service (for which the United States Pharmacopœia is the official standard) and others to the many and important changes in the eighth revision of the Pharmacopœia. It has been in considerable demand throughout the country.

DIVISION OF ZOOLOGY.

Zoological collection.—The collection has been enriched this year by the addition of several important contributions. Of these, particular mention is made of specimens from the Philippines sent by Doctors Woolley, Musgrave, and Herzog, and a collection of ticks sent by Dr. G. H. F. Nuttall.

The international work on zoological nomenclature.—Considerable progress has been made in this work. Bulletin 24, entitled "The international code of zoological nomenclature as applied to medicine,"

has been in general demand, and has resulted in the adoption of the code by many zoologists who formerly paid little or no attention to nomenclature.

During the year another movement of considerable importance in this connection has been started. Communications have been sent to a number of publishing organizations urging the adoption of a rule that they admit to publication no paper containing new generic names unless each new generic name is definitely accompanied by the designation of a generic type. This proposition has been adopted by the following organizations:

United States Fish Commission, United States Geological Survey, United States Department of Agriculture, United States National Museum, United States Public Health and Marine-Hospital Service, Smithsonian Institution, Biological Society of Washington, Entomological Society of Washington; American Museum of Natural History, New York; Academy of Science, Philadelphia; Brooklyn Institute of Arts and Sciences, and Department of Zoology of the Minnesota State Survey.

The National Academy of Sciences decided to call attention of authors to the subject, but would not insist upon the designation of types against the wishes of the author. The Zoological Society of London has decided to apply the rule so far as possible.

Other organizations now have this matter under consideration.

Lectures at the Navy Medical School.—Upon the request of Medical Director Wise, president of the faculty of the Navy Medical School, two courses in medical zoology, one course of about thirty hours and one course of about ten hours, have been given by the chief of this division to the medical officers ordered to the school for special instruction.

DIVISION OF CHEMISTRY.

Considerable time has been spent in the organization and equipment of the chemical division. At the beginning of the fiscal year no provision had been made for chemical work. At present the organization of this division of the laboratory is effective, and the equipment sufficient for satisfactory chemical work.

Some valuable additions have recently been made to the library of the division in the shape of complete sets of the Journal of the London Chemical Society and the Berichte der Deutschen Chemischen Gesellschaft, so that with a number of standard reference books and a complete set of Hoppe-Seyler's Zeitschrift fur Physiologische Chemie the division now has the nucleus of a good working library.

During the year the following routine work has been undertaken and completed:

Opinions and data on chemical subjects furnished the Public Health and Marine-Hospital Service	4
Analyses:	
Drugs and chemicals	29
Drinking waters	3
Miscellaneous	3
Total	35

During the period covered by this report chemical research has been carried on on the following subjects:

"On the stability of the oxidases and their conduct toward various reagents."

"The conduct of phenolphthalein in the animal organism."

"A test for saccharin, and a simple method of distinguishing between cumarin and vanillin."

"The toxicity of ozone and other oxidizing agents to lipase."

"The influence of chemical constitution on the lipolytic hydrolysis of ethereal salts."

The results of these investigations have been published in Bulletin No. 26 of the hygienic laboratory. In cooperation with the director a few preliminary observations have been made on the properties and reactions of tuberculin; some preliminary observations have been made on the relative antiseptic power of certain chemically related substances, such as sulphur dioxide and sulphur trioxide, sulphurous and sulphuric acids, formic aldehyde and formic acid, etc.; a new colorimetric method for the determination of the free hydrochloric acid of stomach contents has been devised, and studies made of variations in the peroxidase activity of the blood in health and disease. The results of this last-named investigation have recently been compiled for publication, and are now in the hands of the Government Printer.

It should be pointed out in this connection that, in this and other investigations undertaken in the division of chemisty of the laboratory, the greatest difficulties have been encountered in obtaining the necessary clinical material for carrying on the work.

The following are some of the objects suggested for investigation during the coming year:

First. An examination of the water supply of the District of Columbia, in cooperation with the division of bacteriology, with the view of discovering, if possible, the cause and mode of origin of typhoid fever, which, according to the health reports, is now on the increase in this locality.

Second. A study of the toxic action of certain compounds of phosphorus, with the view of throwing further light on the cause and nature of phosphorus poisoning and certain phases of fat metabolism.

Third. Studies having for their object the improvement and simplification of clinical tests.

Fourth. A comparative study of the oxidizing power of the blood in health and disease.

Fifth. Studies on the origin and development of certain toxins.

GENERAL REPORT OF THE DIRECTOR.

The general report on the hygienic laboratory for the past year is summarized as follows:

Diphtheria antitoxin.—The standard unit for measuring the strength of diphtheria antitoxin was recognized in the eighth decennial revision of the United States Pharmacopœia, and is therefore both the official and legal standard for this country. The work upon the standard serum was carried out largely by the assistant director and the serum was issued bimonthly throughout the year. The

method of preparing this standard and the object which led up to its production have been fully explained in previous reports and in laboratory bulletins.

Many samples of diphtheria antitoxin purchased on the open market were examined for purity and potency. As a result of such examinations one licensed manufacturer had his license revoked by the Department on account of selling contaminated products. Other faults discovered were reported to the Bureau where measures were taken to have them corrected.

Standard for tetanus antitoxin.—The laboratory is now engaged in making a standard unit for measuring the strength of tetanus antitoxin. Time has proved that, while tetanus antitoxin is of limited use after the disease has announced itself, it is almost a perfect and specific preventive. An increasing amount of this antitoxin is being made and sold in interstate trade. At present the manufacturers, not only in this country, but abroad, have arbitrary standards for measuring the potency of tetanus antitoxin. These standards vary widely. It is plainly the duty of this Service, in accordance with the law of July 1, 1902, to correct this undesirable condition so far as this country is concerned. The director of the laboratory has heretofore instituted a series of experiments in the division of pathology and bacteriology to determine the best method by which the technical difficulties may be overcome. In this work the laboratory has had the cooperation of a committee from the Society of American Bacteriologists, consisting of Dr. Theobald Smith, professor of comparative pathology, Harvard University, Boston, Mass.; Dr. J. J. Kinyoun, director biological laboratories of the H. K. Mulford Company, Glenolden, Pa.; Dr. E. M. Houghton, director biological laboratories, Parke, Davis & Co., Detroit, Mich.; Dr. Joseph McFarland, professor of pathology and bacteriology, Medico-Chirurgical College, Philadelphia, Pa.; Dr. William H. Park, director of the research laboratory, New York City department of health, New York, N. Y.; and Dr. Herbert D. Pease, director antitoxin laboratory, New York State department of health, Albany, N. Y.

The work has progressed favorably and the standard will probably soon be ready for issuance. The tetanus standard will not be an antitoxin, as in the case of diphtheria, but will be based upon a standard toxin. We now have over a quarter of a pound of an exceedingly virulent tetanus toxin, which is preserved under proper conditions to prevent deterioration.

On June 30, 1906, the director of the laboratory recommended to the committee from the Society of American Bacteriologists that the unit for tetanus antitoxin shall be one hundred times the least quantity of serum necessary to save the life of a guinea pig (weighing 300 to 350 grams) against one hundred minimal lethal doses of the standard toxin furnished by the hygienic laboratory, United States Public Health and Marine-Hospital Service. This motion is now being voted upon formally and further progress in this work will be reported at another time.

Examination of vaccines.—The laboratory examines the vaccine virus made by each one of the licensed manufacturers and purchased upon the open market for purity and potency. This work is also

done under the provisions of the law of July 1, 1902. The director recommends that these examinations be made more frequently, and also that experimental work in vaccine virus of a research nature be carried on in order to establish standards of purity and potency, and many other problems connected with the propagation and marketing of this product.

It is also desirable that a complete catalogue of all the bacteria contaminating vaccine virus be made, including accurate descriptions of the morphological, cultural, and biological properties. With more space at our disposal and more workers it is felt that helpful and practical results in this important problem could be obtained.

Examination of disinfectants.—The director of the laboratory was ordered to Reedy Island quarantine station in order to make some experiments with the Kinyoun-Francis furnace to compare with previous experiments made by him at Green Point, Long Island, with the Clayton furnace. A special report under date of February 1 upon this subject was submitted to the Bureau. The following conclusions were reached:

1. Both the Clayton furnace and the Kinyoun-Francis furnace generate a gas which consists mainly of SO_2, but also contains a small but definite amount of SO_3. In view of the experiments done it was found that the Clayton furnace evolved considerably more SO_3 than the Kinyoun-Francis furnace. This may have been due to the fact that the experiments with the Clayton furnace were done in warm, moist weather, which is favorable to the oxidation of SO_2 to SO_3, whereas the experiments with the Kinyoun-Francis furnace were done in comparatively cold and dry weather, which is not favorable to this oxidation.

2. The amount of gas evolved does not seem to be appreciably in favor of the Clayton furnace despite the greater velocity with which the cooled fumes may be pumped. In these experiments it required approximately the same time to consume similar weights of sulphur in the two forms of furnace. The smaller percentage of gas found in the room with the Kinyoun-Francis furnace as compared with that found with the Clayton furnace was doubtless due to the leaky condition of the room, by which large volumes of the gas were seen to blow away.

3. The gas, whether produced by the Kinyoun-Francis furnace or the Clayton apparatus, destroyed most of the nonspore-bearing organisms directly exposed, but in no instance was able to kill the spores. This corresponds to the well-known germicidal powers of sulphur fumes.

4. It was found that the sulphur fumes evolved by the Clayton furnace in the presence of moisture were very destructive to colors, fabrics, paper, and metals. This corresponds to the well-known fact concerning SO_2 evolved by any method.

5. There was very little difference to be seen in the penetration of the gas, whether evolved by the one method or the other. The gas as evolved by the Clayton apparatus sometimes failed to penetrate and destroy germs exposed in perforated pill boxes, in envelopes, etc., which corresponds to the well-known limitations of SO_2 from any source.

6. Sulphur fumes generated by the Clayton furnace were found very destructive to insect and mammalian life, which corresponds to,

the well-known powers of sulphur fumes generated by the Kinyoun-Francis furnace, pot method, or by any other means.

Car disinfection.—The subject of car sanitation has been given an impetus by work done by Passed Asst. Surg. T. B. McClintic, who made many tests in cars to determine the best method of disinfecting them. This practical work was done at the railroad yards through the courtesy of the Pullman Company, who placed many cars at our disposal throughout the season for the purpose of testing the various disinfecting agents and processes. Doctor McClintic's results are embodied in Bulletin 27.

Examination of drugs and chemicals.—Before purchasing drugs for the purveying depot samples are submitted to the laboratory and tests are made either in the division of pharmacology or the division of chemistry. These examinations have resulted in a better quality of drugs issued to the hospitals and other stations of the Service. When this work was begun a large proportion of the drugs submitted were returned; but now that dealers know that these tests are made they are more careful, and it is rather the exception to find an unsatisfactory sample.

Laboratory Bulletins.—Eight bulletins were issued during the year, as follows:

No. 23. Changes in the Pharmacopœia of the United States of America. By Reid Hunt and Murray Galt Motter.

As the United States Pharmacopœia is the official standard for the Public Health and Marine-Hospital Service, as well as for several other branches of the Government, it seemed desirable to call attention in the form of a bulletin to the many and important changes made in the revised edition, which became official September 1, 1905. In this bulletin are described the 117 new articles admitted to the Pharmacopœia and lists of changes in the strength of preparations, changes in names, articles dismissed or added, and a table of doses. The full edition of 5,000 allowed by law was distributed, and in addition the superintendent of documents has sold over 10,000 copies. Owing to its practical nature the bulletin continues to be in demand throughout the country.

No. 24. The international code of zoological nomenclature as applied to medicine. By Ch. Wardell Stiles.

This bulletin contains the English version of the International Code, which governs the use of systematic names. The various rules are discussed and are illustrated by examples of technical names used in medicine. The publication has resulted in the adoption of the code by a number of authors who hitherto have not followed any particular rules in nomenclature.

No. 25. Illustrated key to the cestode parasites of man. By Ch. Wardell Stiles.

This is a compendium to the trematode key (Bulletin No. 17) and is intended as a ready reference key to the cestode parasites which occur in man. It contains analytical keys to the genera and species in question, specific and clinical diagnosis, tables of synonyms, references to zoological and geographic distribution, and indications as to treatment and prevention.

No. 26. (1) On the stability of the oxidases and their conduct toward various reagents. (2) The conduct of phenolphthalein in the animal organism. (3) A test for saccharin, and a simple method

of distinguishing between cumarin and vanillin. (4) The toxicity of ozone and other oxidizing agents to lipase. (5) The influence of chemical constitution on the lipolytic hydrolysis of ethereal salts. By J. H. Kastle.

In the main the titles of these chemical papers are self-explanatory. They have to deal with certain chemical problems of fundamental importance. As indicated by the title, the first communication deals with the stability and general properties of the oxidases, an important group of unorganized ferments concerned in respiration and oxygen metabolism. The second communication is concerned with synthetic processes in the animal organism, and the third with a delicate test for saccharin and an easy method of distinguishing between cumarin and vanillin. These tests have already proved serviceable in the examination of preserved foodstuffs and flavoring extracts for these substances. In the fourth communication it is shown that ozone and other vigorous oxidizing agents are highly poisonous to lipase, the fat-splitting ferment. The fifth communication has to deal with influence of chemical constitution on the hydrolysis of ethereal salts by lipase, a study of which subject was originally undertaken with the view of throwing further light on the hydrolysis of fats in the animal organism.

No. 27. The limitations of formaldehyde gas as a disinfectant, with special reference to car sanitation. By Thomas B. McClintic.

In this bulletin are contained the results of practically one year's continuous work with formaldehyde—one of the most extensive investigations of this gas as a disinfectant ever undertaken. The conclusions throw additional light upon this disinfectant, showing that the gas is insufficient at a temperature below 60° F. and a relative humidity of 65 per cent. Under other conditions of atmosphere and temperature the gas is valuable as a germicide. The various methods of generating the gas are discussed and compared at some length.

No. 28. A statistical study of the prevalence of intestinal worms in man. By Ch. Wardell Stiles and P. E. Garrison.

This bulletin contains the results of examinations of 3,457 persons for intestinal worms, tabulated by ages, sex, occupation, race, etc., and comparisons with over 25,000 examinations by other authors for different parts of the world. The recently advanced theory that intestinal worms play an inoculating rôle in typhoid is not supported by these statistics.

No. 29. A study of the cause of sudden death following the injection of horse serum. By M. J. Rosenau and John F. Anderson.

This work deals essentially with hypersusceptibility, a phenomenon which has been little studied in connection with the broad problems of immunity. It throws light upon the cause of collapse and sudden death, which sometimes follows the injection of horse serum, and also gives a possible explanation of idiosyncrasy to fish and other proteid matter. The demonstration of the transmission of hypersusceptibility from the mother guinea pig to her young may help our studies upon tuberculosis, particularly upon the question why this disease "runs in families."

No. 30. (1) Maternal transmission of immunity to diphtheria toxine. (2) Maternal transmission of immunity to diphtheria toxine

and hypersusceptibility to horse serum in the same animal. By John F. Anderson.

The results obtained in this bulletin undoubtedly throw light upon the irregularities obtained by some manufacturers in the testing of antidiphtheria serum, especially those who have been in the habit of using their recovered guinea pigs for breeding purposes. The second portion of this bulletin discloses one of the most remarkable discoveries in biology, namely, the transmission from mother to offspring of immunity to one poison and hypersusceptibility to another.

The United States Pharmacopœia.—The director of the laboratory urgently recommends closer relations between the United States Pharmacopœia and the Service. The Pharmacopœia has officially recognized the Service work in the matter of the standard unit for diptheria antitoxin. The physiological standards for drugs and chemicals is work for which the division of pharmacology is peculiarly fitted, and it is believed that both this division of the laboratory and the Pharmacopœia would derive mutual benefit by official cooperation.

LABORATORY COURSE FOR STUDENT OFFICERS.

During the fiscal year just past, owing to strenuous and unusual duties thrown upon the Service, no student officers were assigned to the laboratory for instruction. During the previous fiscal year four student officers were given the course of instruction outlined in Bulletin 8 of the laboratory series, and since the close of the fiscal year officers have been detailed both to assist in the laboratory and to receive instruction.

The Journal Club of the laboratory, which meets weekly for the purpose of reviewing current public health literature and to discuss work, has continued its sessions.

LECTURES TO NAVAL MEDICAL STUDENTS.

The director of the laboratory and the chief of the division of zoology have each given two courses of lectures to the Naval Medical School, located quite near the laboratory, the former upon quarantine, antitoxin, vaccine virus, etc., and the latter upon medical zoology.

The entente cordiale between these two branches of the Government service is strengthened by these relations.

ADVISORY BOARD, HYGIENIC LABORATORY.

On May 21, 1906, in response to a call by the Surgeon-General, the members of the advisory board of the hygienic laboratory convened at the Surgeon-General's office, as provided by law, for consultation with him "relative to the investigations to be inaugurated and the methods of conducting the same in said laboratory."

This was the first meeting of the advisory board. It had not been deemed advisable to call a meeting previously, pending the completion of the building and the equipment thereof, and the organization of the several branches provided by law. It is contem-

plated, however, to hold these conferences each year, ten days being allowed each year under the terms of the law.

The following members were present: Prof. William H. Welch, Prof. Victor C. Vaughan, Prof. Wm. T. Sedgwick, Prof. F. F. Wesbrook, Maj. W. D. McCaw, U. S. Army; Surg. John F. Urie, U. S. Navy, and Dr. A. D. Melvin, United States Bureau of Animal Industry. But one member was absent, unavoidably.

After preliminary consultation with the Surgeon-General, the director of the hygienic laboratory, the latter, being ex officio a member of the board, conducted the visitors to the laboratory building, where the greater part of the day was spent in a careful inspection of all its departments. Later another meeting was held in a room provided at the New Williard Hotel, where Professor Welch was elected chairman of the advisory board and Doctor Rosenau its secretary. The board then discussed and agreed upon the contents of its report.

The laboratory is fortunate in enjoying the counsel of an advisory board composed of eminent scientists with ripened experience in research work. The inspiration derived both from the board collectively and its members individually has encouraged the laboratory corps, and it is felt that in the future the wisdom of this provision of the law of 1902 will become more and more manifest, bringing the national laboratory into scientific touch with most of the large private or corporate laboratories in the United States and permitting the coordination of scientific work and opportunity to avoid unnecessary duplication of scientific investigation.

BUILDING AND GROUNDS OF THE HYGIENIC LABORATORY.

The material growth of the laboratory during the past two years has greatly overcrowded its present facilities. Attention is again invited to the fact that the building was constructed at a cost of $35,000, as provided in the appropriation of March 4, 1901. At that time the work of the laboratory was confined to pathology and bacteriology, and the building was not designed to accommodate the three additional divisions afterwards established by the act approved July 1, 1902.

It is also urgently recommended that separate rooms be provided for certain work of a dangerous nature, or which requires delicate manipulation. For example: The tetanus work, diphtheria investigations, vaccine examinations, tubercle work, plague investigations, etc., should be carried on in separate rooms so as to avoid the possibility of accidents. There should also be a separate room for the delicate analytical balances, and certain details of chemical, pharmacological, and zoological work should be conducted apart.

The library now contains about 2,500 books and pamphlets. The accommodations for this number of publications in the one small room used as the library are so meager that it is necessary to distribute the books throughout the building wherever shelf room can be found.

The grounds surrounding the laboratory are unimproved and unsightly. The approaches to the building in bad weather render access thereto uncomfortable and difficult. I have, therefore, to re-

new my recommendation for an appropriation sufficient to erect an additional building and to improve the grounds. An estimate of $75,000 has been forwarded for this purpose.

Fraudulent use of the Mails with Regard to Medical Devices and Sanitary Certificates.

During the year a number of requests have been received from the Postmaster-General through the Department for a statement as to the therapeutic value of various devices and remedies advertised as assured methods of cure of disease.

These letters, together with the papers and devices submitted, have been referred to the sanitary board, and in each instance report has been made that the devices submitted were without efficacy and that the claims made were false.

The findings transmitted to the Postmaster-General have been of assistance to him in preventing the fraudulent use of the mails in these instances.

The assistance of the Postmaster-General has in turn been invoked by the Bureau, through the Department, with regard to a matter which has given some annoyance. Several advertisements have been received in the Bureau from different sources which have contained indorsements quoted from "United States Health Reports." These indorsements are usually certificates of the value of some medical device for the cure of disease, or the purity of some product, or of the good sanitary condition of institutions. The Bureau has received these advertisements from writers who inquire if the publication known as "United States Health Reports" is issued under Government supervision. The name, form, and phraseology used by this publication makes it so closely simulate the weekly Public Health Reports, published by the Department, that deception is evidently intended.

The papers have been referred to the Postmaster-General for action, as it is believed the transmission of such advertising matter through the mails constitutes a fraud within the meaning of the United States postal laws.

National and International Sanitary Conferences.

Two important sanitary conventions have been held in Washington during the past fiscal year, the Service being closely connected with both of them.

The first was the Second International Sanitary Convention of American Republics, and the second was the Fourth Annual Conference of State Health Authorities with the Surgeon-General of the Public Health and Marine-Hospital Service.

SECOND INTERNATIONAL SANITARY CONVENTION OF THE AMERICAN REPUBLICS.

This convention was held at the New Willard Hotel October 9–14, 1905. Twelve republics were represented, viz, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, United States, Guatemala, Mexico, Nicaragua, Peru, Uruguay, and Venezuela.

The Surgeon-General called the convention to order with a few introductory remarks. Addresses of welcome were made by the Hon. Elihu Root, Secretary of State, and the Hon. H. A. Taylor, Acting Secretary of the Treasury, by the Hon. Gonzalo de Quesada, minister to the United States from Cuba, and Hon. Williams C. Fox. Director of the Bureau of American Republics.

The Surgeon-General of the Public Health and Marine-Hospital Service was elected president of the convention, and Dr. Eduardo Liceaga, president of the superior board of health of Mexico, was elected president of the Third International Sanitary Convention, which it was voted should be held in the City of Mexico in December, 1907, subject to the call of the International Sanitary Bureau. The organization and personnel of this last-named Bureau was continued as provided for by the First International Sanitary Convention, which was held in Washington in December of 1902. These conventions are hereafter to meet every two years.

The delegate from Costa Rica, Dr. Juan J. Ulloa, was elected permanent secretary.

The International Sanitary Bureau is composed as follows: Surgeon-General Wyman, chairman; Dr. Eduardo Liceaga, Dr. Rhett Goode, Dr. Juan Guiteras, Dr. A. H. Doty, Dr. Juan J. Ulloa, and Dr. Eduardo Moore.

Among the resolutions passed were the following relating to the suppression of yellow fever:

Whereas the Republic of Mexico and the Panama Canal Zone, by the application of the mosquito doctrine to public sanitation, are nearing rapidly the desideratum of the final extinction of yellow fever; and

Whereas the Republic of Cuba, by the application of the same methods, has continued to maintain its territory free from yellow fever; and

Whereas, through lack of preparation and application of these methods, the spread of yellow fever has been permitted in certain countries; and

Whereas in the city of New Orleans an epidemic which unfortunately took a firm foothold has been held in check and has been gradually reduced by the application of the same methods in the midst of the largest nonimmune population that was ever exposed to yellow fever:

Therefore, be it resolved,

I. That this convention sees in these results a further confirmation of the view that yellow fever is naturally transmitted only by the bite of infected mosquitoes.

II. That the convention is of the opinion that an efficient plan of defense against the propagation of yellow fever at the beginning of an epidemic can be easily established upon the basis of this doctrine.

III. That the successful carrying out of such plan depends upon a thorough understanding of the mosquito doctrine by the people, and upon the support that they may give to the prompt and frank reporting and the proper handling of the first cases and of all suspicious cases.

IV. That the convention expresses the censure of the sanitary authorities that do not report in due time the presence of yellow fever in their territory.

V. That the congratulations of the convention be extended to the Republics of Mexico and Cuba and to the Canal Zone of Panama for the success attained; and also to the Public Health and Marine-Hospital Service for the brilliant work done in New Orleans.

And be it further resolved,

IV. That in the opinion of this convention all maritime quarantine and the management of all epidemics that threaten to extend to neighboring states and countries should be placed in the hands of the national health authorities.

But the principal work of this convention, and one which will give it lasting significance and importance, was the preparation of an agreement embodying the principles and regulations to be observed

in the quarantine treatment of cholera, plague, and yellow fever. With regard to cholera and plague the convention adopted, with minor alterations, the provisions of the treaty made in accordance with the sanitary convention held in Paris in 1903, to which treaty the Government of the United States is also signatory. Additions were made to this convention of Paris in the nature of articles relating to yellow fever. The agreement was signed ad referendum by the delegates, and has been ratified by the President of the United States, with the advice and consent of the Senate, under date of May 29, 1906. Information has been received that most, if not all, of the republics represented have likewise ratified the agreement. By resolution it was provided that copies of the agreement should be sent through the proper channels to the few republics of America who were not represented in this convention.

It may be added that among the resolutions passed by the Third International Conference of American States, held in Rio de Janeiro, July and August, 1906, it was recommended to all the republics of the Western Hemisphere to adopt this same agreement.

There was great satisfaction manifested by all the delegates over their achievement in the preparation of an agreement relative to these three diseases which so vitally affect health and commercial relations of all the republics. This agreement prepares the way to more advanced efforts in the suppression of contagious disease, for it is evident that while provision has been made for the proper handling of these diseases after they have become prevalent, a greater and more wise policy is to prevent their propagation at the foci of infection—in other words, to prevent their getting a start. This means sanitary and hygienic measures necessary to eliminate the faulty conditions in localities which encourage the breeding of these diseases. This idea was communicated by myself in a letter to Secretary Root on his request for sanitary suggestions which might be properly brought by the American delegates before the conference of American States in Rio during the past summer. The letter written to Secretary Root and which he included in his instructions to the American delegates is appended hereto, together with the resolutions on sanitary matters passed by the Rio conference.

The principles involved are those which have been advocated persistently in the annual reports of this Service during the past few years.

A specific suggestion made to the American delegates to the conference of American States in Mexico, 1901–2, was published in pamphlet form in both English and Spanish as a supplement to Public Health Reports of October 11, 1901. The measures therein suggested for the enforcement of sanitation in the yellow-fever ports of the Western Continent were not adopted, nor was it expected that they would be at that time, but they served the purpose of pointing to a standard toward which efforts should be made and had an influence in the adoption of the resolutions under which the international sanitary conventions are now held. The resolutions passed recently at Rio place upon the next international sanitary convention, to be held in Mexico, December, 1907, the necessity of working out some method or agreement by the several republics for sanitation of unsanitary cities and localities.

SUGGESTIONS ON SANITATION AND QUARANTINE FOR CONSIDERATION BY THE RIO CONFERENCE.

My letter to the Secretary of State, containing suggestions relative to the Rio conference, was as follows:

TREASURY DEPARTMENT,
BUREAU OF PUBLIC HEALTH AND MARINE HOSPITAL SERVICE,
Washington, May 30, 1906.

Hon. ELIHU ROOT, *Secretary of State.*

SIR: In accordance with your request I submit herewith certain considerations regarding quarantine, hygiene, and sanitation, which appear to me worthy of being brought before the third conference of American States to be held in Rio de Janeiro in July next.

PROPOSITIONS.

First. International conferences on health matters have heretofore considered only the management of epidemic diseases in their progress from one nation to another.

Second. These diseases are simply the result of unhygienic conditions in the several countries.

Third. These unhygienic conditions are local, and the responsibility on their account lies with municipal or state authorities.

Fourth. The national governments therefore are required to deal with conditions due to faults of the states and municipalities.

Fifth. In the measures to prevent the spread of disease from one country to another, plainly the duty of national governments, the latter are therefore dealing only with the effects and not with the cause; they are dealing with the symptoms rather than with the causative conditions.

Sixth. Therefore, notwithstanding that the fons et origo of disease is ordinarily considered as within the legal jurisdiction and administration (police power) of the states and municipalities, the national governments must find some means of exercising effective influence in these local conditions which produce disastrous effects that quickly become the care and responsibility of the nation.

Seventh. Quarantine and quarantinable diseases which heretofore have been the subjects of international conventions and agreements should now be put to one side as having been duly considered and acted upon; and an advance should be made in international deliberations by the consideration of hygiene and sanitation. In other words, the deliberations of international sanitarians should be transferred from ships to the shore.

Eighth. In considering the possibility of an international agreement for a more direct and effective influence of the national governments in local sanitation and hygiene it will be more practicable to limit such agreement to seaport cities and towns, since these are the points of contact between nations.

Ninth. In the effort to perfect the sanitary and hygienic condition of seaports we find an international commercial justification therefor in the resultant elimination of yellow fever. There is another all-important disease—tuberculosis—for whose elimination the commercial reason does not apply, but against which the whole civilized world is making warfare. This disease, on account of its universality and contagiousness, is well worthy of consideration in international agreement, irrespective of the commercial relations between nations.

Tenth. In the sanitary and hygienic measures necessary to eliminate the two above-mentioned diseases—yellow fever and tuberculosis—are embraced the sanitary and hygienic measures (with the exception of minor details) necessary to overcome all the greater epidemic and the domestic contagious diseases.

Eleventh. The more specific the objects of any agreement, the more direct and effective will be the efforts to enforce it. Therefore there is recommended an international agreement for national effort in sanitary and hygienic measures necessary to eliminate yellow fever and tuberculosis.

From the foregoing propositions it appears necessary that the central, or national, government of each republic should give greater attention to local sanitary measures. It is admitted that the activity of the national government in local sanitation is more difficult in some of the republics than in

others, yet it is believed that in all much can be accomplished beyond the present activities and beyond the limitations which now seem to be acknowledged.

The proposed limitation of an international agreement to seaports is defended by the following considerations:

First. Seaports have a more direct influence in conveying disease from one country to another than interior ports.

Second. The good effect of sanitation in seaports will be so obvious that interior cities will take note thereof and profit by the example.

Third. By making the agreement relate to seaports only the scope thereof is limited and defined and the plan, therefore, more practicable.

It may be remarked that in many of our larger seaport cities, such as New Orleans, Rio de Janeiro, Veracruz, and others, sanitary improvements of a broad character, such as improved water supplies, sewerage, drainage, and paving, are already under way.

In quite a number of the smaller ports, particularly in some of the Central and South American republics, there has been manifested during the past four years an awakening to the need of sanitation, and actual work has been done. But in all our larger ports, no matter how extensive the improvements, much remains to be done to bring local sanitation and hygiene up to the required standard, and in numerous smaller ports in all of the republics, both on the Atlantic and Pacific coasts, sanitation is at the present time outrageously neglected. These smaller seaport towns and cities are potent factors in the breeding and dissemination of disease, and yet their proper sanitation would involve comparatively moderate expense.

In considering local sanitary measures it is worthy of note that measures to eradicate and prevent two of the most important diseases will be sufficient practically for the eradication of other communicable diseases.

Sanitation for tuberculosis requires sufficiency of air and sunlight in domiciles, good water supply, drainage, and sewerage, while the sanitation for yellow fever, demanding the removal of collections of water to prevent the breeding of mosquitoes, involves general hygienic condition of premises, so that with the cleanliness in and around the domicile, and assurance of the proper environments of man, conditions are produced favorable to the elimination of all disease.

The whole civilized world is fighting against tuberculosis, the great white plague, which causes at least one in seven of all deaths, and any international agreement for its suppression will redound to the honor of every nation concerned therein. As to the yellow plague, yellow fever, a disease which is the curse of the Western Hemisphere, conjoint action of the republics is necessary for its elimination.

It is therefore respectfully suggested that the delegates from the United States to the Rio conference endeavor to secure from the conference, by treaty or by resolution, or in whatever form they deem to be most practicable, the adherence of each of the republics represented in the conference to the foregoing principles and their practical application.

The agreement should recite that epidemic diseases, which so frequently require national intervention, are due to insanitary local conditions, and that the central or national administration of each republic will use its utmost endeavors to institute and enforce locally in its several seaports all the sanitary measures, destructive, constructive, and administrative, which are necessary to eliminate tuberculosis and yellow fever.

In addition to the reasons given above showing the necessity for such an international agreement, there are others which, though less urgent, should nevertheless lend encouragement thereto. It gives opportunity for the countries represented in the Rio conference to set an example which may be utilized in the coming Hague conference, at which it is understood all the republics of the Western Hemisphere will be represented.

In the present relations of nations with one another there are two facts which seem strangely at variance: First, the regularly increasing naval and military armaments; second, the rapidly growing sentiment for universal peace and disarmament.

Few will deny that universal peace is a desideratum. It is said that it is the purpose of the Interparliamentary Union to make of the Hague conference a permanent body composed of two houses—an upper house representing the executives of the world, and a lower house composed of the members of the highest legislative bodies of the powers of the earth.

Even if such a body is formed it would be marvelous if of itself it should be able to bring about a disarmament of the nations. Increase in armaments provides increase of employment of all kinds—manual, professional, and administrative, and furnishes an outlet for the energy of a nation. It is worth considering whether a diversion of this energy is not more practicable than its abrupt termination.

A celebrated manufacturer in the United States, with a plant covering several acres, was much annoyed by the mischievous activities of a large number of boys in the neighborhood who trespassed upon the property, maliciously injuring the same. Instead of arresting them and causing their punishment, he diverted their energies by purchasing land immediately around his plant and employing them in the development of lawns and gardens, thus adding to the attractiveness and utility of his possessions and transforming his annoying neighbors into agents of help.

This may be a homely illustration, but surely an international hygienic agreement which would demand physical operations of great scope, and professional and administrative energies of the highest character would be more effective by diverting such energies from naval and military establishments than would be an effort to discontinue or abandon the military and naval armaments.

The same principles apply whether reference is made to disarmament, arbitration, or the world-wide movement for peace.

An international agreement for sanitation, with the avowed purpose of eliminating communicable diseases, will furnish a plane upon which nations may meet, and an object for attack against which all nations may combine without fear of international complications.

In closing there is one more suggestion which I have respectfully to make.

At the second international conference of American States, in the city of Mexico, 1901–2, resolutions were passed providing for international sanitary conventions and for the establishment of an international sanitary bureau. Two conventions have been held, and at the last one, held in the city of Washington, October, 1905, there was signed by the delegates an agreement ad referendum relating to the management of ships and persons infected with or exposed to the infection of cholera, bubonic plague, and yellow fever. This agreement has been approved by the Senate of the United States, and it is expected that it will be approved by the governing bodies of the other nations represented in the convention. It is worthy of the efforts of the delegates from the United States to secure the adherence to this same convention of those of the republics of the Western Hemisphere which were not represented at the Washington meeting. The adherence of every republic in the Western Hemisphere to the principles announced in that convention would make complete so far as possible the understanding with regard to these quarantinable diseases and would enable all of the republics hereafter to give their undivided attention, so far as international agreement is concerned, to the more important subjects of hygiene and sanitation.

Respectfully,

WALTER WYMAN.
Surgeon-General,
Chairman, International Sanitary Bureau.

RESOLUTIONS PASSED BY THE THIRD INTERNATIONAL CONFERENCE OF AMERICAN STATES, RIO DE JANEIRO, AUGUST 23, 1906.

SANITATION AND QUARANTINE.

The Third International American Conference recognizes the utility of the principles of international sanitary police, which inspired the last convention celebrated in Rio de Janeiro, applicable to a definite region, and the convention signed in Washington on the 14th of October, 1905, which is applicable to all the nations of America, and, in virtue of this, recommends to the countries here represented:

1. That, as a general rule, they adopt the said International Sanitary Convention of Washington, adhering to it and putting its precepts into practice.

2. The adoption of measures tending to obtain the sanitation of the cities, and especially of the ports, and to attain, as far as possible, to a better knowledge and a greater observance of hygienic and sanitary principles.

3. The advisability that all American nations attend the next International Sanitary Convention, to be celebrated in the City of Mexico in December, 1907.

and that they instruct their respective delegates to study and solve the following points:

A. Practical means of rendering effective the second of the present recommendations.

B. Establishment and regulation in each of the American countries of a committee composed of three medical or sanitary authorities to constitute, under the direction of the International Sanitary Bureau, established at Washington, an international sanitary committee of information of the American Republics, with authority to meet and to communicate among themselves data referring to public health, and to serve any other purpose that the convention may think proper.

C. Establishment and regulation in some place in South America designated by the convention of a center of sanitary information that shall supply to the already existing International Sanitary Bureau the elements necessary to carry out the recommendations 5, 6, and 7 on sanitary police made by the Second International American Conference.

D. Establishment of relations between the International Bureau established at Washington and the Bureau Sanitaire International of Paris, in order to obtain the best information in sanitary matters and take resolutions tending to the object intrusted to both bureaus.

4. In accordance with the provisions of the article 3, paragraph c, the city of Montevideo is hereby designated as the seat of the center of sanitary information.

AUGUST 23, 1906.

The committee on "sanitary police and quarantine" of the Third International American Conference, Rio de Janeiro, which reported the above resolutions, was composed as follows: Dr. J. X. da Silveira, Brazil; Dr. J. A. Terry, Argentina; Señor Gonzalo de Quesada, Cuba; Dr. J. D. de Obaldia, Panama; Señor Tulio Larrinaga, United States; Señor Larraburre y Unanue, Peru; Señor J. R. Molina, Honduras.

FOURTH ANNUAL CONFERENCE OF STATE BOARDS OF HEALTH WITH THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

In accordance with the law of 1902, the fourth annual conference of State health authorities with the Service was held at the New Willard Hotel, Washington, D. C., May 23, 1906. Twenty-seven States, one Territory, and the District of Columbia were represented.

The value of these conferences in quarantine matters has been previously referred to. The better acquaintance of the health officers with the Service brought about by these conferences has increased mutual confidence and consequently the ease and efficiency of administration. But there is a greater value in these conferences in that they bring forth expressions of opinion from health officers from different portions of the United States on matters pertaining to the public health which are of vital interest to the National as well as State governments.

The subjects of discussion at the previous conference—namely, that of 1905—were the "National control of leprosy," "Methods of transmission of typhoid fever," and "Sanitation of railway cars." In this year's conference—1906—the subjects for discussion were "Car sanitation," again, with special reference to tuberculosis, and the general subject of "Prevention of tuberculosis." A third topic, and a very important one, was the "Pollution of streams."

Each delegate is called upon for expression of opinion or narration of facts concerning each of the subjects that have been announced for consideration. The opinions thus expressed are of value to the

Bureau in its consideration of proposed national action, whether under already existing laws or with regard to proposed legislation. For example, under the interstate features of the quarantine law of 1893 it is believed that interstate quarantine regulations could be made and enforced by the Department with regard to certain diseases which are not now included in the interstate quarantine regulations. Expressions from the State health officers are valuable as practically furnishing advice on such matters. At the last conference each officer was requested to state whether in his opinion it is necessary and practicable to forbid the use on interstate railway passenger coaches of the common drinking cup. The reply in the affirmative was unanimous, yet it developed in the discussion that in all probability the railroads would cheerfully acquiesce in any rules which were authoritatively recommended. The use of the common drinking cup is but one of quite a number of matters which require attention from a sanitary standpoint with regard to railway passenger travel. It is a question of considerable moment, even if the law permits, whether it is advisable to make a large number of special regulations which must be observed by the railroads under penalty for nonobservance; and before undertaking to make such legal requirements it is believed, partly as a result of the deliberations of this conference, that advisory regulations issued by this Service with the affirmative opinion of the State authorities will be accepted by the railroads and put in practice. A plan of this kind is now in course of preparation, leaving to the future the issue of official regulations under the law should such action be required.

With regard to pollution of streams, many interesting and useful facts and opinions were elicited in this conference and will aid the Bureau in its consideration of a proposed bill to be introduced in Congress to prevent unnecessary pollution of rivers in the United States. This bill has been referred to the Bureau for consideration.

The proceedings of the annual conference for 1906 have been printed and add one more to the series of yearly transactions containing much valuable information concerning national and State health matters.

A special quarantine conference in March, 1906, is previously noted in the account of domestic quarantine transactions.

During the past year a number of communications have been received, expressing appreciation of the work of the Public Health and Marine-Hospital Service and a desire for its increased usefulness. Among other communications of this kind may be mentioned resolutions passed by the American Pharmaceutical Association in September, 1905; by the American Public Health Association in 1905; by the National Rivers and Harbors Congress, January, 1906; and resolutions of the American Medical Association in July, 1905, the last including a recommendation to Congress that the Service be aided in every proper manner in the prosecution of its important duties, and that in its efforts to protect and improve the public health it be strengthened in any manner necessary to promote its efficiency and character as the national health organization.

Respectfully,

WALTER WYMAN, *Surgeon-General.*

Hon. LESLIE M. SHAW,
Secretary of the Treasury.

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